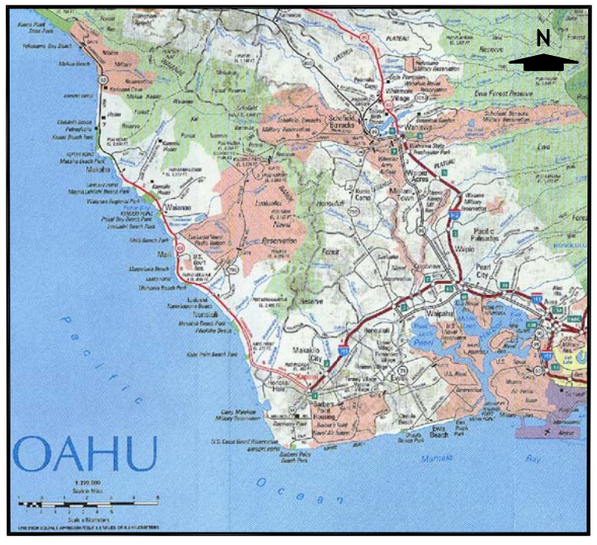
CONSTRUCTION DRAWINGS
CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII
JANUARY 2010



VICINITY MAP

PREPARED FOR:

WASTE MANAGEMENT OF HAWAII, INC.
92-460 FARRINGTON HIGHWAY
KAPOLEI, HAWAII 96707
PHONE: (808) 640-9427

GEOSYNTEC INDEX OF SHEETS

SHEET NO.	TITLE
1	COVER AND INDEX SHEET
2	SITE PLAN AND EXISTING TOPOGRAPHY
3	BASE GRADING PLAN AND LCRS LAYOUT IN CELLS E5–E7
4	BASE GRADING PLAN AND LCRS LAYOUT IN CELL E8
5	CONTAINMENT SYSTEM DETAILS I
6	CONTAINMENT SYSTEM DETAILS II
7	CONTAINMENT SYSTEM DETAILS III
⚠8	CONTAINMENT SYSTEM DETAILS IV
9	CONTAINMENT SYSTEM DETAILS V
10	CONTAINMENT SYSTEM DETAILS VI
11	CONTAINMENT SYSTEM DETAILS VII
12	STAGE 1 MSW PLACEMENT PRIOR TO PHASE 2 WEST BERM
13	PHASE 2 WEST BERM PRIOR TO STAGE 2 MSW PLACEMENT
14	STAGE 2 MSW PLACEMENT PRIOR TO PHASE 3 WEST BERM
15	PHASE 3 WEST BERM PRIOR TO STAGE 3 MSW PLACEMENT
16	STAGE 3 MSW PLACEMENT ABOVE CELLS E5 AND E6
⚠⚠17	WEST BERM FINAL COVER DETAILS I
18	CONSTRUCTION CROSS SECTION– SECTION S–1
19	CONSTRUCTION CROSS SECTION– SECTION S–2
20	CONTAINMENT SYSTEM DETAILS VIII
21	CONTAINMENT SYSTEM DETAILS IX
22	CONTAINMENT SYSTEM DETAILS X
23	CELL BOUNDARIES AND PROPOSED LINER LIMIT
⚠24	CELL E8 SUMP
⚠25	WEST BERM BUTTRESS
⚠26	SCHEMATIC PLAN VIEW OF SURFACE WATER PIPES

⚠ REVISION 11 FEB 2010
⚠ REVISION 11 MAR 2010
⚠ REVISION 16 MAR 2010

GEI (WESTERN SURFACE WATER DRAINAGE) INDEX OF SHEETS

SHEET NO.	TITLE
C–0	VICINITY/PROJECT AREA MAP AND LIST OF DRAWINGS
C–01	PROJECT NOTES
C–02	PLAN AND PROFILE OF MODIFICATIONS
C–03	PLAN AND PROFILE PERMANENT DRAINAGE STA. 0+00 TO STA. 12+00
C–04	PLAN AND PROFILE PERMANENT DRAINAGE STA. 12+00 TO STA. 27+00
C–05	PLAN AND PROFILE PERMANENT DRAINAGE STA. 27+00 TO STA. 42+00
C–06	PLAN AND PROFILE PREMANENT DRAINAGE STA. 42+00 TO STA. 57+00
C–07	PLAN AND PROFILE PERMANENT DRAINAGE STA. 57+00 TO STA. 67+00
C–08	DIVERSION STRUCTURE PLAN AND SECTIONS
C–09	TRANSITION STRUCTURE PLAN AND SECTIONS
C–10	TRANSITION STRUCTURE PLAN AND SECTIONS STA. 52+44
C–11	TYPICAL SECTIONS (SHEET 1 OF 2)
C–12	TYPICAL SECTIONS (SHEET 2 OF 2)
C–13	MISCELLANEOUS DETAILS (SHEET 1 OF 2)
C–14	MISCELLANEOUS DETAILS (SHEET 2 OF 2) AND CONSTRUCTION NOTES
C–15	TRASHRACK PLANS, SECTIONS, AND DETAILS
C–16	PLAN AND PROFILE TEMPORARY DRAINAGE STA. 0+00 TO STA. 15+00
C–17	PLAN AND PROFILE TEMPORARY DRAINAGE STA. 15+00 TO STA. 30+00
C–18	PLAN AND PROFILE TEMPORARY DRAINAGE STA. 30+00 TO STA. 45+00
C–19	PLAN AND DETAILS SURFACE DRAINAGE OF EXCAVATION BENCHES
C–20	84–INCH AND 36–INCH HDPE DETAILS IN CONCRETE LINED CHANNEL
C–21	DOWNSTREAM STILLING FACILITIES PLAN AND SECTIONS
C–22	FLIP BUCKET STRUCTURE PLAN AND SECTIONS
C–23	TEMPORARY DRAINAGE DIVERSION BERM AND INLET DETAILS

PREPARED BY:

Oakland • California
GEI Consultants

Geosyntec consultants
engineers | scientists | innovators

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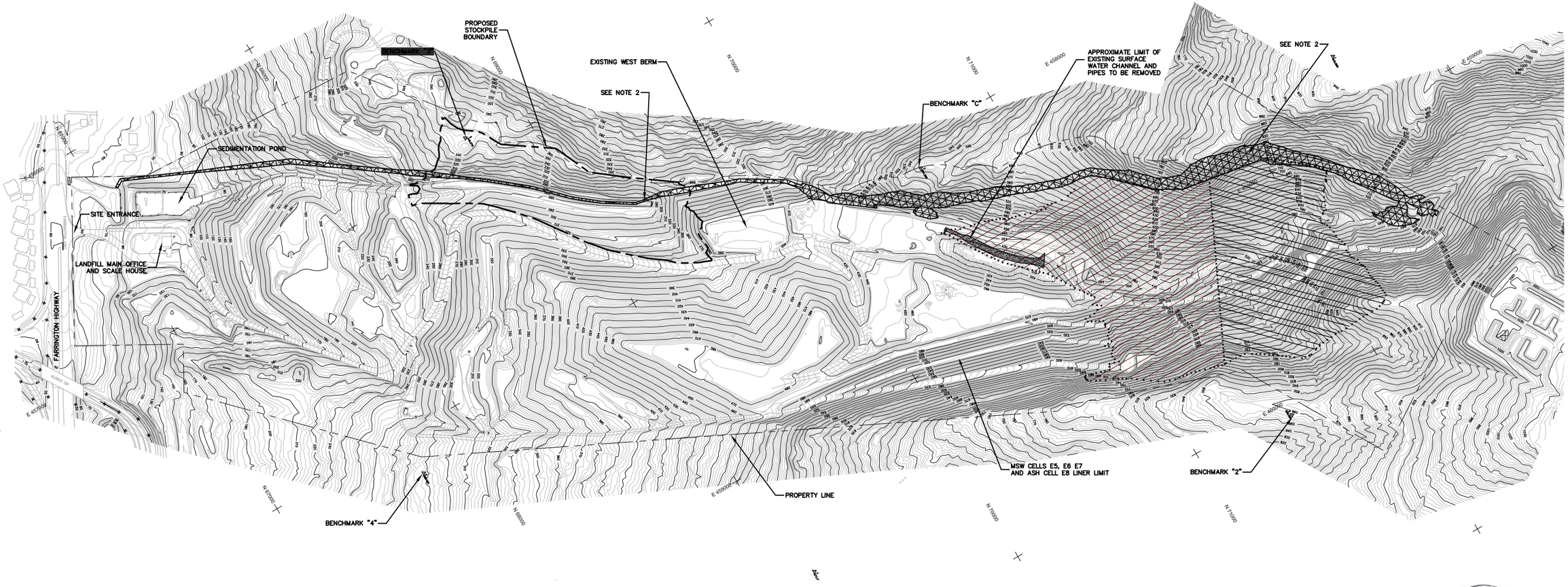
PROJECT NO. WL0770

SHEET NO: 1 OF 49

P:\CAD\Land Projects 3\WM\Waimanalo\Jeny\Cells E5-E8 and Partial West Berm Construction\E5-E8-COVER CONSTRUCTION DRAWINGS.dwg 3-16-10 APalowski

SURVEY CONTROL TABLE			
CONTROL POINT	NORTHING	EASTING	ELEVATION
BENCHMARK "C"	70534.53	458106.11	554.58
BENCHMARK "2"	71498.04	460070.34	858.69
BENCHMARK "3"	68693.03	456898.25	345.67
BENCHMARK "4"	67705.03	458206.6	288.16



GENERAL NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER.

2. FOR WESTERN DRAINAGE IMPROVEMENTS REFER TO "WAIMANALO GULCH LANDFILL, WESTERN SURFACE WATER DRAINAGE PROJECT, EWA BEACH, OAHU, HAWAII, JANUARY 2010–CONSTRUCTION DRAWINGS", PREPARED BY GEI CONSULTANTS, INC.

3. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE–GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.

LOCATION OF EXISTING UTILITIES SHALL BE CLEARLY MARKED BY FLAGGED 4–FT HIGH WOODEN STAKES AT 100–FT INTERVALS AND PAINT ON THE GROUND SURFACE. NEARER INTERVALS MAY BE REQUIRED BASED ON FIELD CONDITIONS. CONTRACTOR SHALL MONITOR AND MAINTAIN THE MARKINGS DURING THE CONSTRUCTION PROJECT UNTIL FINAL ACCEPTANCE OF THE WORK BY THE OWNER/OPERATOR.

4. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CITY, STATE AND FEDERAL HEALTH AND SAFETY REQUIREMENTS TO GUARD AND PROTECT ALL WORKERS, PEDESTRIANS, AND THE PUBLIC FROM EXCAVATIONS, BLASTING OPERATIONS, CONSTRUCTION EQUIPMENT, TRAFFIC, CONSTRUCTION OPERATIONS, ALL OBSTRUCTIONS, AND OTHER DANGEROUS ITEMS (E.G., LANDFILL GAS) OR AREAS. A HEALTH AND SAFETY PLAN IS REQUIRED AS PART OF THE WORK.

LEGEND

- 590 — EXISTING GROUND 10–FT CONTOUR (MSL)
- EXISTING GROUND 2–FT CONTOUR (MSL)
- 288.16 — EXISTING BENCHMARK
- PROPERTY LINE
- CELLS E5, E6, AND E7 LIMIT OF EARTHWORK
- CELL E8 APPROXIMATE LIMIT OF EARTHWORK
- WESTERN SURFACE WATER DRAINAGE APPROXIMATE LIMIT OF EARTHWORK (SEE NOTE 2)
- PROPOSED STOCKPILE BOUNDARY

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250 125 0 250 500
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants
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SITE PLAN AND EXISTING TOPOGRAPHY

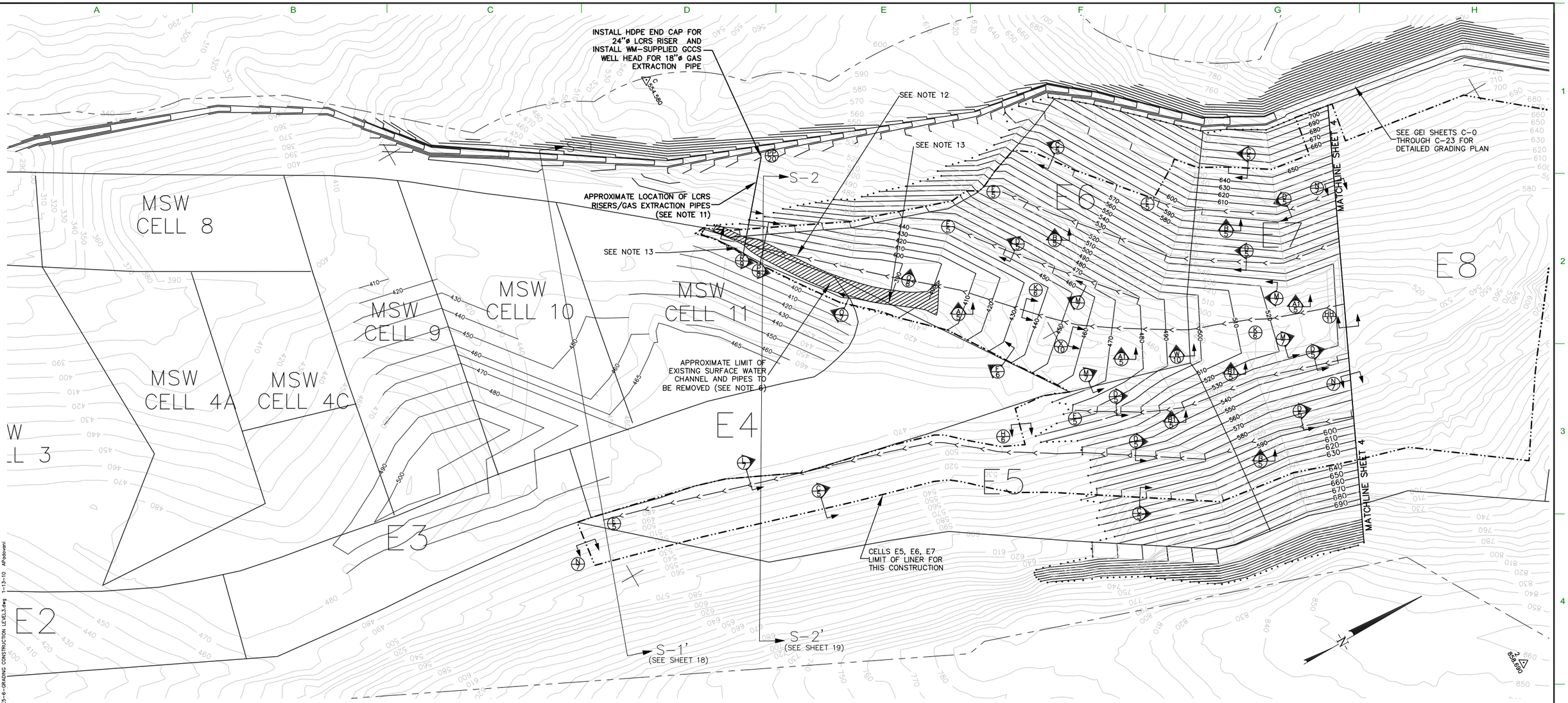
CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	
FILE:	

SHEET NO. 2

P:\CADD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E6 and Partial West Berm Construction\E5-E6-SITE PLAN CONSTRUCTION LEVEL.dwg 1-13-10 Khuynh



NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER. WASTE ELEVATIONS MAY VARY.

2. THE LOCATION OF TIE-IN TO EXISTING LINER SHOWN IS APPROXIMATE. ACTUAL LOCATION OF TIE-IN SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND MAY VARY FROM LAYOUT SHOWN. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION, AND EXTEND AND CONNECT NEW LINER SYSTEM COMPONENTS TO EXISTING AS NECESSARY TO MAINTAIN LINER SYSTEM CONTINUITY.

3. GRADES ALONG TIE-IN MAY BE ADJUSTED AS NEEDED TO MATCH EXISTING SUBGRADE CONDITIONS WITH APPROVAL BY THE ENGINEER.

4. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.

5. BEFORE, DURING, AND AFTER STORM EVENTS, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.

6. EXISTING CONCRETE CHANNEL (INCLUDING WINGWALLS AND HEADWALL) AND EXISTING 48" ø PIPES TO BE REMOVED WITHIN THIS AREA, PRIOR TO SUBGRADE PREPARATION OF CELL E6.

7. BENCHES THAT WILL NOT RECEIVE LINER SHALL BE LOCALLY GRADED SO THAT WATER FLOWS AWAY FROM LANDFILL.

8. IF COLLUVIUM OR ALLUVIUM ARE ENCOUNTERED DURING EXCAVATION, SLOPES SHALL BE RE-EVALUATED AND MAY NEED TO BE FLATTENED.

9. A SUBDRAIN PIPE MAY BE REQUIRED TO COLLECT SEEPS. SEEPS TO BE IDENTIFIED BY A GEOLOGIST. SUBDRAIN PIPE MAY NEED TO BE EXTENDED PAST THE LIMITS CURRENTLY SHOWN.

10. CONTRACTOR SHALL ALLOW A GEOLOGIST TO ACCESS THE EXCAVATED SLOPES FOR GEOLOGIC MAPPING AND TO CONFIRM THAT THE SLOPES WILL BE STABLE.

NOTES (CONT.):

11. RISER PIPES SHALL BE EXTENDED AS WEST BERM IS CONSTRUCTED.

12. AREA OF INCREASED GRAVEL THICKNESS SHOWN ON SHEET 4.

13. EXCAVATION FOR SUMP AREA AND ITS VICINITY WILL REQUIRE SPECIAL PROVISIONS; THEREFORE COORDINATION WITH OWNER/OPERATOR WILL BE REQUIRED.

14. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE-GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.

LOCATION OF EXISTING UTILITIES SHALL BE CLEARLY MARKED BY FLAGGED 4-FT HIGH WOODEN STAKES AT 100-FT INTERVALS AND PAINT ON THE GROUND SURFACE. NEARER INTERVALS MAY BE REQUIRED BASED ON FIELD CONDITIONS. CONTRACTOR SHALL MONITOR AND MAINTAIN THE MARKINGS DURING THE CONSTRUCTION PROJECT UNTIL FINAL ACCEPTANCE OF THE WORK BY THE OWNER/OPERATOR.

15. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CITY, STATE AND FEDERAL HEALTH AND SAFETY REQUIREMENTS TO GUARD AND PROTECT ALL WORKERS, PEDESTRIANS, AND THE PUBLIC FROM EXCAVATIONS, BLASTING OPERATIONS, CONSTRUCTION EQUIPMENT, TRAFFIC, CONSTRUCTION OPERATIONS, ALL OBSTRUCTIONS, AND OTHER DANGEROUS ITEMS (E.G., LANDFILL GAS) OR AREAS. A HEALTH AND SAFETY PLAN IS REQUIRED AS PART OF THE WORK.

16. LINER LIMITS SHOWN ARE EXPECTED TO BE CONSTRUCTED BETWEEN 2010 AND 2014.

17. LIMIT OF FUTURE WASTE FILL IN CELLS E5 THROUGH E8 MAY CHANGE DEPENDING ON FUTURE WASTE STREAM.

HARI D. SHARMA LICENSED PROFESSIONAL ENGINEER No. 10894 HAWAII, U.S.A.

LEGEND

- 480 — CELLS E5 THROUGH E7 BASE GRADE 10-FT CONTOUR (MSL)
- 500 — EXISTING GROUND 10-FT CONTOUR (MSL)
- 500 — CELL E4 WASTE GRADES 10-FT CONTOUR (MSL)
- EXISTING BENCHMARK
- CELL BOUNDARY/LIMIT OF FUTURE WASTE FILL (NOTE 17)
- PROPERTY LINE
- APPROXIMATE LIMIT OF EARTHWORK
- LCRS PIPING
- APPROXIMATE CELLS E5 THROUGH E8 LINER LIMIT (NOTE 16)
- S-1 S-1' CROSS SECTION LINE

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants
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Oakland, CA 94612

BASE GRADING PLAN AND LCRS LAYOUT IN CELLS E5-E7

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS		
DES BY: ACP	DATE: JANUARY 2010	SHEET NO. 3
DRN BY: ACP	SCALE: AS SHOWN	
CHK BY: FWS	PROJECT: WL0770	
REV BY: HDS	DOCUMENT:	
APP BY: HDS	FILE:	

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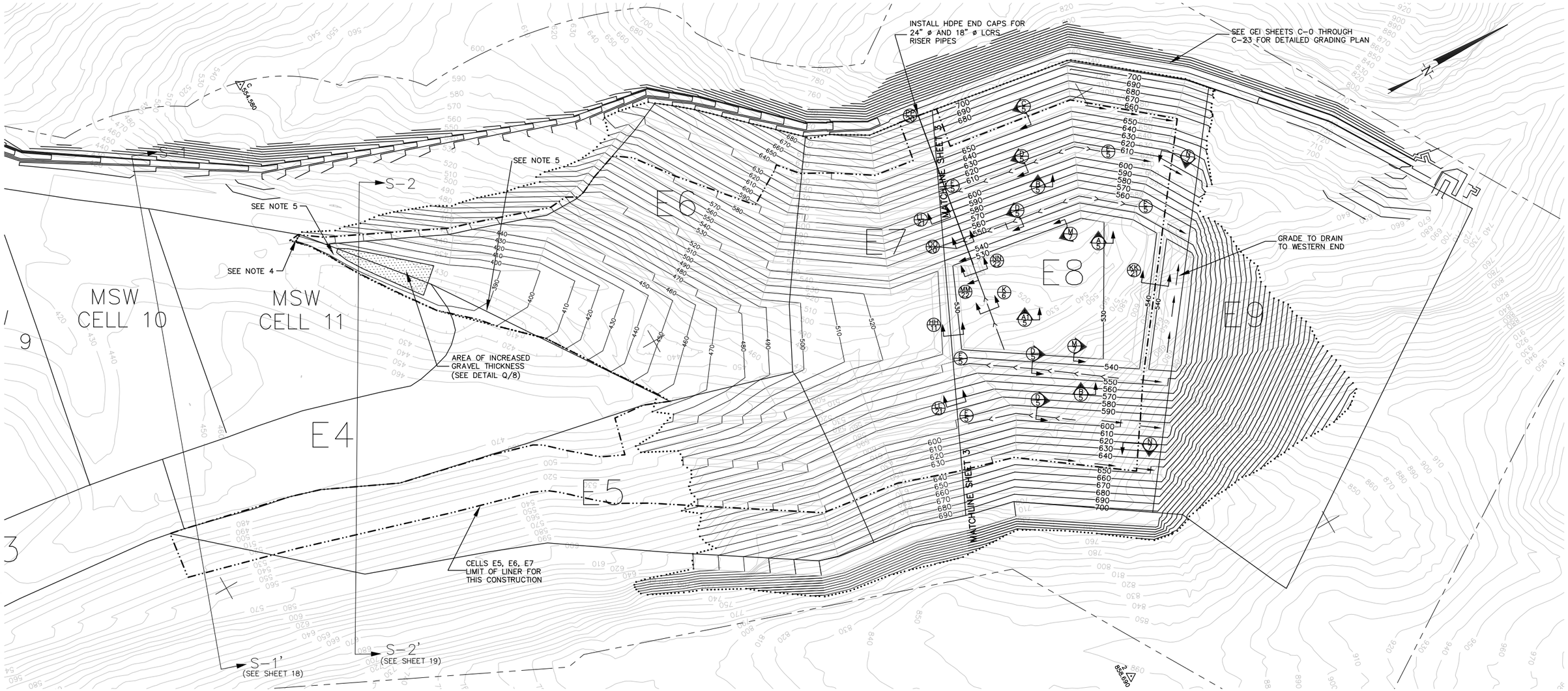

NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER. WASTE ELEVATIONS MAY VARY.

2. BEFORE, DURING, AND AFTER STORM EVENTS, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.

3. SLOPES SHALL BE EXCAVATED FROM TOP DOWN. CONTRACTOR SHALL ALLOW A GEOLOGIST TO ACCESS THE EXCAVATED SLOPES FOR GEOLOGIC MAPPING AND TO CONFIRM THAT THE SLOPES WILL BE STABLE.

4. THE LOCATION OF THE 36-INCH HDPE PIPE SHOWN IN THE AREAS OF CELLS E5 AND E6 MAY NEED TO BE FIELD-ADJUSTED DURING CONSTRUCTION BASED ON THE ACTUAL LOCATION OF THE 48-INCH CMP IN THE E6 SUMP AREA. CONTRACTOR SHALL SUBMIT/CONFIRM FINAL LOCATION LAYOUT OF 36-INCH HDPE PIPE FOR THE ENGINEER.

5. EXCAVATION FOR SUMP AREA AND ITS VICINITY WILL REQUIRE SPECIAL PROVISIONS; THEREFORE COORDINATION WITH OWNER/OPERATOR WILL BE REQUIRED.

6. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE-GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.

LOCATION OF EXISTING UTILITIES SHALL BE CLEARLY MARKED BY FLAGGED 4-FT HIGH WOODEN STAKES AT 100-FT INTERVALS AND PAINT

NOTES (CONT.):

ON THE GROUND SURFACE. NEARER INTERVALS MAY BE REQUIRED BASED ON FIELD CONDITIONS. CONTRACTOR SHALL MONITOR AND MAINTAIN THE MARKINGS DURING THE CONSTRUCTION PROJECT UNTIL FINAL ACCEPTANCE OF THE WORK BY THE OWNER/OPERATOR.

7. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CITY, STATE AND FEDERAL HEALTH AND SAFETY REQUIREMENTS TO GUARD AND PROTECT ALL WORKERS, PEDESTRIANS, AND THE PUBLIC FROM EXCAVATIONS, BLASTING OPERATIONS, CONSTRUCTION EQUIPMENT, TRAFFIC, CONSTRUCTION OPERATIONS, ALL OBSTRUCTIONS, AND OTHER DANGEROUS ITEMS (E.G., LANDFILL GAS) OR AREAS. A HEALTH AND SAFETY PLAN IS REQUIRED AS PART OF THE WORK.

8. LINER LIMITS SHOWN HERE ARE EXPECTED TO BE CONSTRUCTED BETWEEN 2010 AND 2014.

9. CONTRACTOR TO GRADE SLOPE/BENCH TO DRAIN IN FLOW DIRECTION AS SHOWN. REFER TO GEI SHEETS C-0 THROUGH C-23 FOR DITCH GRADING.

10. LIMIT OF FUTURE WASTE FILL IN CELLS E5 THROUGH E8 MAY CHANGE DEPENDING ON FUTURE WASTE STREAM.

HARI D. SHARMA
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No. 10884
HAWAII, U.S.A.

LEGEND

- 530 — CELL E8 BASE GRADE 10-FT CONTOUR (MSL)
- 800 — EXISTING GROUND 10-FT CONTOUR (MSL)
- 800 — EXISTING CELLS E5 THROUGH E7 BASE GRADES 10-FT CONTOUR (MSL)
- 4 / 288.16 — EXISTING BENCHMARK
- CELL BOUNDARY/LIMIT OF FUTURE WASTE FILL (NOTE 10)
- PROPERTY LINE
- APPROXIMATE LIMIT OF EARTHWORK
- LCRS PIPING
- APPROXIMATE CELLS E5 THROUGH E8 LINER LIMIT (NOTE 8)
- FLOW DIRECTION (SEE NOTE 9)
- S-1 S-1' — CROSS SECTION LINE

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

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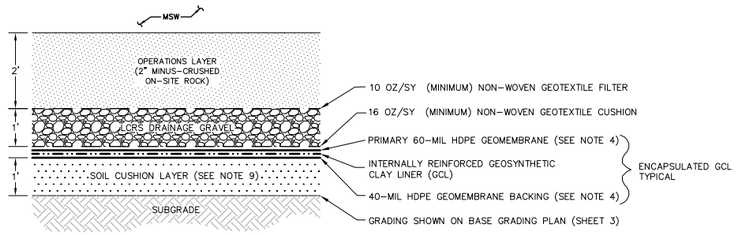
BASE GRADING PLAN CELLS E8

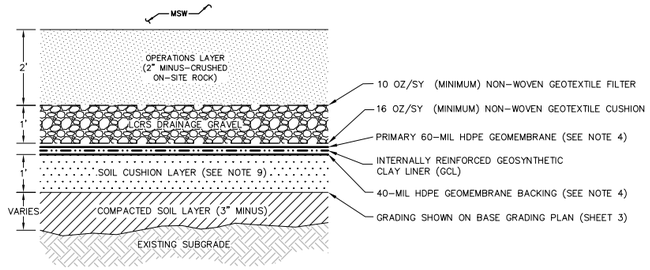
CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS		
DES BY: ACP	DATE: JANUARY 2010	SHEET NO. 4
DRN BY: ACP	SCALE: AS SHOWN	
CHK BY: FWS	PROJECT: WL0770	
REV BY: HDS	DOCUMENT:	
APP BY: HDS		
FILE:		

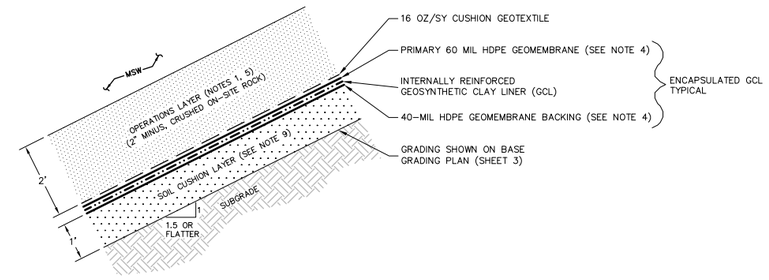
P:\CADD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E8 and Partial West Berm Construction\E5-E8 GRADING CONSTRUCTION LEVEL3.dwg 1-13-10 APadovani



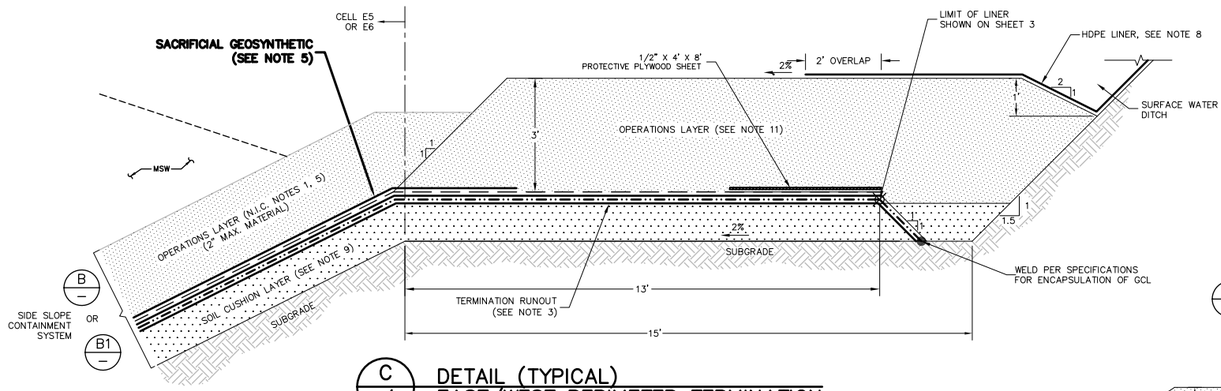
A 3/4 DETAIL (TYPICAL)
FLOOR CONTAINMENT SYSTEM
NOT TO SCALE



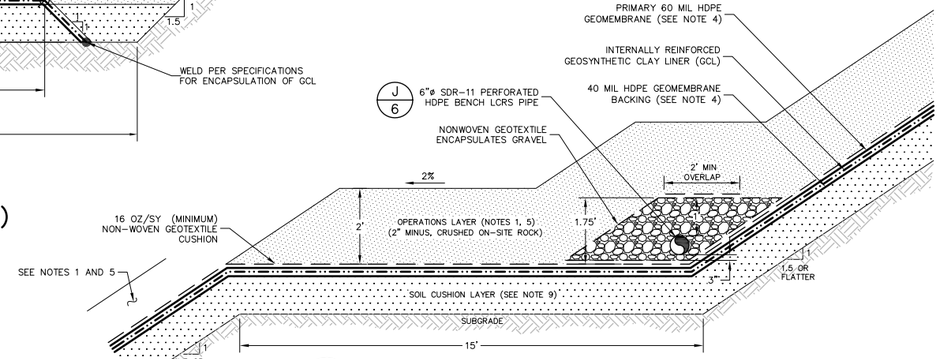
A1 3/4 DETAIL (TYPICAL)
FLOOR CONTAINMENT SYSTEM IN AREAS OF FILL
NOT TO SCALE



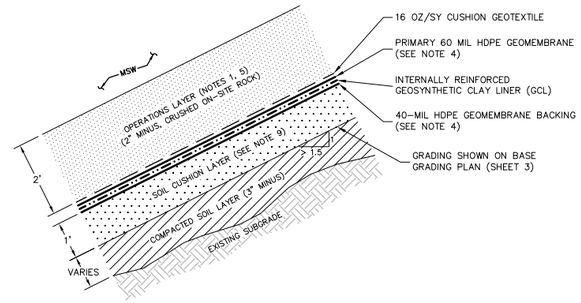
B 3/4 DETAIL (TYPICAL)
SIDE SLOPE CONTAINMENT SYSTEM
NOT TO SCALE



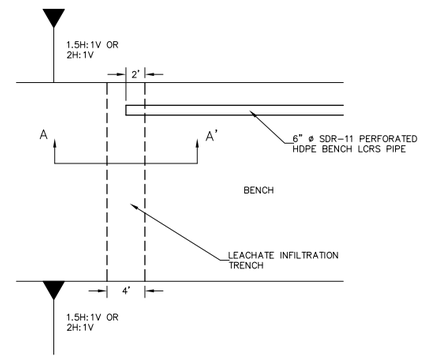
C 3/4 DETAIL (TYPICAL)
EAST/WEST PERIMETER TERMINATION ALONG BENCH (SEE NOTES 3 AND 11)
NOT TO SCALE



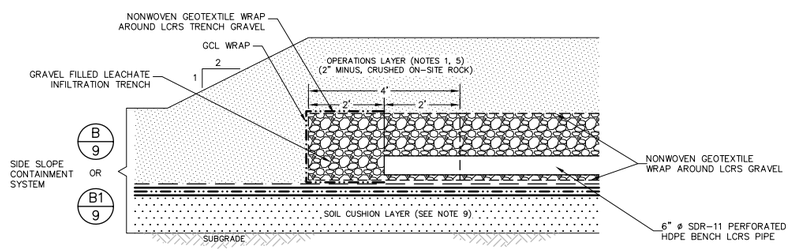
D 3/4 DETAIL (TYPICAL)
LINER SYSTEM AT BENCH (SEE NOTES 3 AND 11)
NOT TO SCALE



B1 3 DETAIL (TYPICAL)
SIDE SLOPE CONTAINMENT SYSTEM IN AREAS OF FILL
NOT TO SCALE



E 3/4 SCHEMATIC (TYPICAL)
LEACHATE INFILTRATION TRENCH ON BENCH
NOT TO SCALE



E1 — SECTION A-A' (TYPICAL)
ON BENCH
NOT TO SCALE

NOTES:

1. CONTRACTOR TO PLACE OPERATIONS LAYER ON FLOOR, BENCHES AND 10 FEET ALONG THE SIDE SLOPE LENGTH ABOVE THE FLOOR OR BENCH. OWNER TO PLACE OPERATIONS LAYER SOIL ON SIDE SLOPE BEYOND THE 10-FT REQUIREMENT IN THIS CONTRACT IN COORDINATION WITH WASTE PLACEMENT. OPERATIONS LAYER SHALL MEET REQUIREMENTS FOR PERMEABILITY AND GRADATION IN THE SPECIFICATIONS. THE MAXIMUM OPERATING WEIGHT OF THE EQUIPMENT USED BY THE CONTRACTOR (DURING CONSTRUCTION) AND BY THE OWNER (DURING OPERATIONS) TO PLACE OPERATIONS LAYER SHALL BE A CATERPILLAR D3C LGP OR EQUIVALENT. NO BRAKING IS ALLOWED WHEN PLACING OPERATIONS LAYER SOIL ALONG THE SIDESLOPES.

2. INSTALLER TO PROVIDE SANDBAGS AND OTHER METHODS TO PROTECT THE EXPOSED GEOSYNTHETICS FROM WIND UPLIFT AND SHALL SUBMIT THEIR PLAN FOR APPROVAL BY OPERATOR.

3. TERMINATION OF GEOSYNTHETICS SHOWN ON DRAWINGS ARE FOR POST-CONSTRUCTION ANCHOR TRENCH LOADS. INSTALLER/CONTRACTOR ARE RESPONSIBLE FOR MAINTAINING ANCHORAGE OF GEOSYNTHETICS DURING CONSTRUCTION UNTIL OWNER ACCEPTS THE WORK. AFTER CONSTRUCTION, OWNER IS RESPONSIBLE FOR ANCHORAGE UNTIL HDPE GEOMEMBRANE IS OVERLAIN BY PROTECTIVE OPERATIONS LAYER AS PART OF LANDFILLING OPERATIONS (SEE NOTES 1 AND 5).

4. FOR ALL CELLS, GEOMEMBRANE SHALL BE TEXTURED ON BOTH SIDES.

5. CONTRACTOR, WITH PRIOR APPROVAL FROM OWNER, TO DEPLOY SACRIFICIAL GEOMEMBRANE IN AREAS WHERE GEOTEXTILE CUSHION WILL BE EXPOSED FOR MORE THAN 60 DAYS. OWNER TO REMOVE SACRIFICIAL GEOMEMBRANE BEFORE PLACING OPERATIONS LAYER. SACRIFICIAL GEOSYNTHETICS, IF DEPLOYED, SHALL BE REMOVED BY THE OWNER DURING OPERATIONS.

6. SCREENED BACK FEATURES CORRESPOND TO EXISTING OR FUTURE LAYERS.

7. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION. EXTEND AND CONNECT NEW CONTAINMENT SYSTEM TO EXISTING CONTAINMENT SYSTEM AS NECESSARY TO MAINTAIN A CONTINUOUS CONTAINMENT SYSTEM; I.E., (A) WELD NEW GEOMEMBRANE TO EXISTING GEOMEMBRANE; (B) THE WELD SHALL BE A MINIMUM 4 FT AWAY FROM THE EDGE OF THE SLOPE; (C) OVERLAP THE NEW GCL A MINIMUM OF 2 FT OVER THE EXISTING GCL; AND (D) THE GEOTEXTILE SHALL BE SEWN. ALL WELDING, OVERLAPING, AND SEWING SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS.

8. TEMPORARY SURFACE WATER DITCH SHALL BE LINED WITH HDPE LINER OR EQUIVALENT SELECTED BY OPERATOR. ALONG THE FLOWLINE OF SURFACE WATER DITCH, LINER SHALL BE OVERLAPPED A MINIMUM OF 3 FEET WITH THE END OF THE UPSTREAM PANEL SHINGLED OVER THE END OF THE DOWNSTREAM PANEL. CHANNEL LINING SHALL BE SECURED WITHOUT DAMAGING THE UNDERLYING GEOSYNTHETICS/LINER SYSTEM ON THE BENCH. OPERATOR TO MAINTAIN DITCH LINING AS NEEDED, AS PART OF OPERATIONS.

9. IF SOIL CUSHION LAYER CAN NOT BE PLACED ON THE SIDE SLOPES, THEN THE SUBGRADE SHALL RECEIVE GUNITE HAVING SURFACE PROJECTIONS LESS THAN 0.25 INCH TO RECEIVE GEOSYNTHETICS.

10. INSTALLER TO STAGE DEPLOYMENT OF GEOSYNTHETICS SO THAT EQUIPMENT DOES NOT NEED TO DRIVE DIRECTLY OVER ALREADY DEPLOYED GEOSYNTHETIC CLAY LINER (GCL) OR GEOMEMBRANE. ALLOWED GROUND PRESSURES OVER GEOSYNTHETICS ARE PROVIDED IN THE SPECIFICATIONS AND MUST BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION. CONTRACTOR TO STAGE AND COORDINATE PLACEMENT OF DRAINAGE GRAVEL AND OPERATIONS LAYER SO THAT GCL, GEOMEMBRANE, AND GEOTEXTILES ARE NOT DRIVEN OVER UNLESS MATERIAL THICKNESSES LISTED IN THE SPECIFICATIONS ARE MET.

11. OPERATIONS SOIL LAYER ALONG THE BENCHES SHALL BE PLACED PRIOR TO PLACEMENT OF THE LCRS GRAVEL AND OPERATIONS SOIL ALONG THE SLOPES, IN ORDER TO PROVIDE SUFFICIENT ANCHORAGE FOR THE GEOSYNTHETICS ALREADY IN PLACE ALONG THE SLOPES.

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P:\CAD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E6 and Partial West Berm Construction\E5-E6 DETAILS CONSTRUCTION LEVEL_REV.dwg 1-13-10 CMong

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

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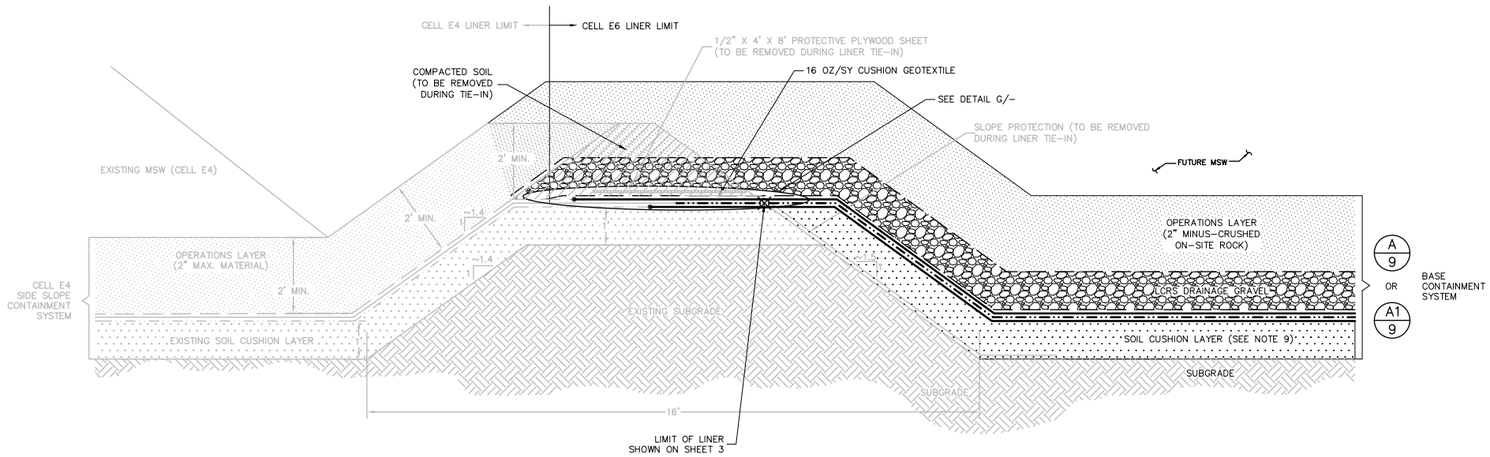
CONTAINMENT SYSTEM DETAILS I
CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

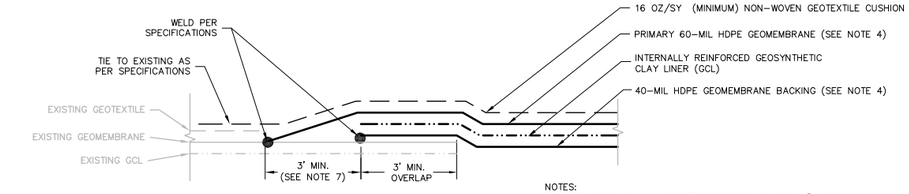
CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	
FILE:	

SHEET NO. 5

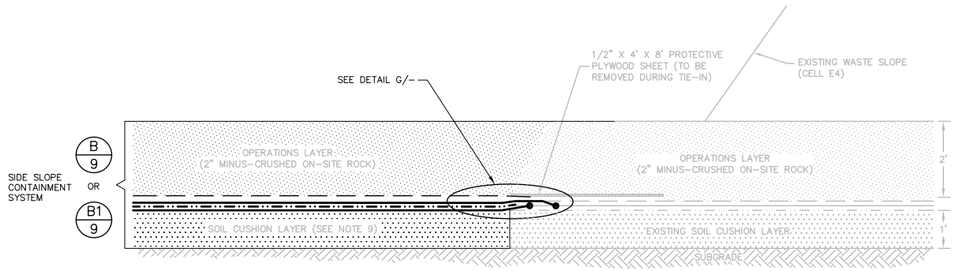


F/3 DETAIL (TYPICAL)
CELLS E4/E6 LINER TIE-IN ALONG CELL E4 TERMINATION BERM (SEE NOTES 6 AND 7)
NOT TO SCALE

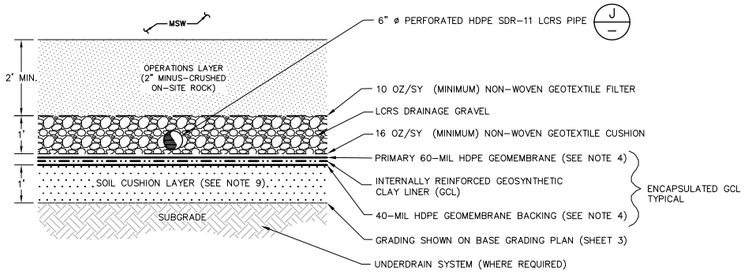


NOTES:
IF EXISTING GCL IS IN HYDRATED CONDITION, PLACE 18" WIDE GEOMEMBRANE STRIP ALONG EDGE OF EXISTING HYDRATED GCL BEFORE OVERLAPPING NEW GCL ON TOP OF EXISTING GCL.

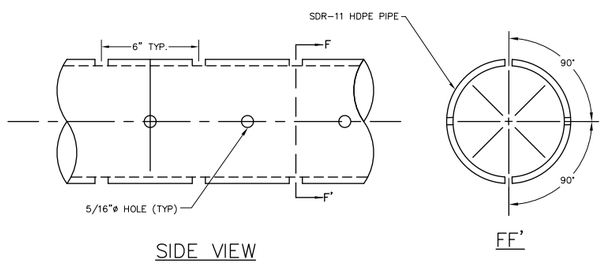
G/- DETAIL (TYPICAL)
TIE-IN OVERLAP EXISTING CELLS (11 OR E4) TO E5 AND E6
NOT TO SCALE



H/3 DETAIL (TYPICAL)
CELLS E4/E5 LINER TIE-IN ALONG SIDE SLOPE (SEE NOTES 6 AND 7)
NOT TO SCALE



K/3/4 DETAIL (TYPICAL)
CENTRAL LCRS PIPE COLLECTOR ALONG FLOOR
NOT TO SCALE



J/- DETAIL (TYPICAL)
HDPE COLLECTION LCRS AND GAS PIPE PERFORATION (INCLUDING RISER)
NOT TO SCALE

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10004
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NOTES:

1. CONTRACTOR TO PLACE OPERATIONS LAYER ON FLOOR, BENCHES AND 10 FEET ALONG THE SIDE SLOPE LENGTH ABOVE THE FLOOR OR BENCH. OWNER TO PLACE OPERATIONS LAYER SOIL ON SIDE SLOPE BEYOND THE 10-FT REQUIREMENT IN THIS CONTRACT IN COORDINATION WITH WASTE PLACEMENT. OPERATIONS LAYER SHALL MEET REQUIREMENTS FOR PERMEABILITY AND GRADATION IN THE SPECIFICATIONS. THE MAXIMUM OPERATING WEIGHT OF THE EQUIPMENT USED BY THE CONTRACTOR (DURING CONSTRUCTION) AND BY THE OWNER (DURING OPERATIONS) TO PLACE OPERATIONS LAYER SHALL BE A CATERPILLAR D3C LGP OR EQUIVALENT. NO BRAKING IS ALLOWED WHEN PLACING OPERATIONS LAYER SOIL ALONG THE SIDESLOPES.

2. INSTALLER TO PROVIDE SANDBAGS AND OTHER METHODS TO PROTECT THE EXPOSED GEOSYNTHETICS FROM WIND UPLIFT AND SHALL SUBMIT THEIR PLAN FOR APPROVAL BY OPERATOR.

3. TERMINATION OF GEOSYNTHETICS SHOWN ON DRAWINGS ARE FOR POST-CONSTRUCTION ANCHOR TRENCH LOADS. INSTALLER/CONTRACTOR ARE RESPONSIBLE FOR MAINTAINING ANCHORAGE OF GEOSYNTHETICS DURING CONSTRUCTION UNTIL OWNER ACCEPTS THE WORK. AFTER CONSTRUCTION, OWNER IS RESPONSIBLE FOR ANCHORAGE UNTIL HDPE GEOMEMBRANE IS OVERLAIN BY PROTECTIVE OPERATIONS LAYER AS PART OF LANDFILLING OPERATIONS (SEE NOTES 1 AND 5).

4. FOR ALL CELLS, GEOMEMBRANE SHALL BE TEXTURED ON BOTH SIDES.

5. CONTRACTOR, WITH PRIOR APPROVAL FROM OWNER, TO DEPLOY SACRIFICIAL GEOMEMBRANE IN AREAS WHERE GEOTEXTILE CUSHION WILL BE EXPOSED FOR MORE THAN 60 DAYS. OWNER TO REMOVE SACRIFICIAL GEOMEMBRANE BEFORE PLACING OPERATIONS LAYER. SACRIFICIAL GEOSYNTHETICS, IF DEPLOYED, SHALL BE REMOVED BY THE OWNER DURING OPERATIONS.

6. SCREENED BACK FEATURES CORRESPOND TO EXISTING OR FUTURE LAYERS.

7. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION. EXTEND AND CONNECT NEW CONTAINMENT SYSTEM TO EXISTING CONTAINMENT SYSTEM AS NECESSARY TO MAINTAIN A CONTINUOUS CONTAINMENT SYSTEM; I.E., (A) WELD NEW GEOMEMBRANE TO EXISTING GEOMEMBRANE; (B) THE WELD SHALL BE A MINIMUM 4 FT AWAY FROM THE EDGE OF THE SLOPE; (C) OVERLAP THE NEW GCL A MINIMUM OF 2 FT OVER THE EXISTING GCL; AND (D) THE GEOTEXTILE SHALL BE SEWN. ALL WELDING, OVERLAPING, AND SEWING SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS.

8. INSTALLER TO STAGE DEPLOYMENT OF GEOSYNTHETICS SO THAT EQUIPMENT DOES NOT NEED TO DRIVE DIRECTLY OVER ALREADY DEPLOYED GEOSYNTHETIC CLAY LINER (GCL) OR GEOMEMBRANE. ALLOWED GROUND PRESSURES OVER GEOSYNTHETICS ARE PROVIDED IN THE SPECIFICATIONS AND MUST BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION. CONTRACTOR TO STAGE AND COORDINATE PLACEMENT OF DRAINAGE GRAVEL AND OPERATIONS LAYER SO THAT GCL, GEOMEMBRANE, AND GEOTEXTILES ARE NOT DRIVEN OVER UNLESS MATERIAL THICKNESSES LISTED IN THE SPECIFICATIONS ARE MET.

9. IF SOIL CUSHION LAYER CAN NOT BE PLACED ON THE SIDE SLOPES, THEN THE SUBGRADE SHALL RECEIVE GUNITE HAVING SURFACE PROJECTIONS LESS THAN 0.25 INCH TO RECEIVE GEOSYNTHETICS.

REVISIONS			
NO.	DESCRIPTION	DATE	BY

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CONTAINMENT SYSTEM DETAILS II

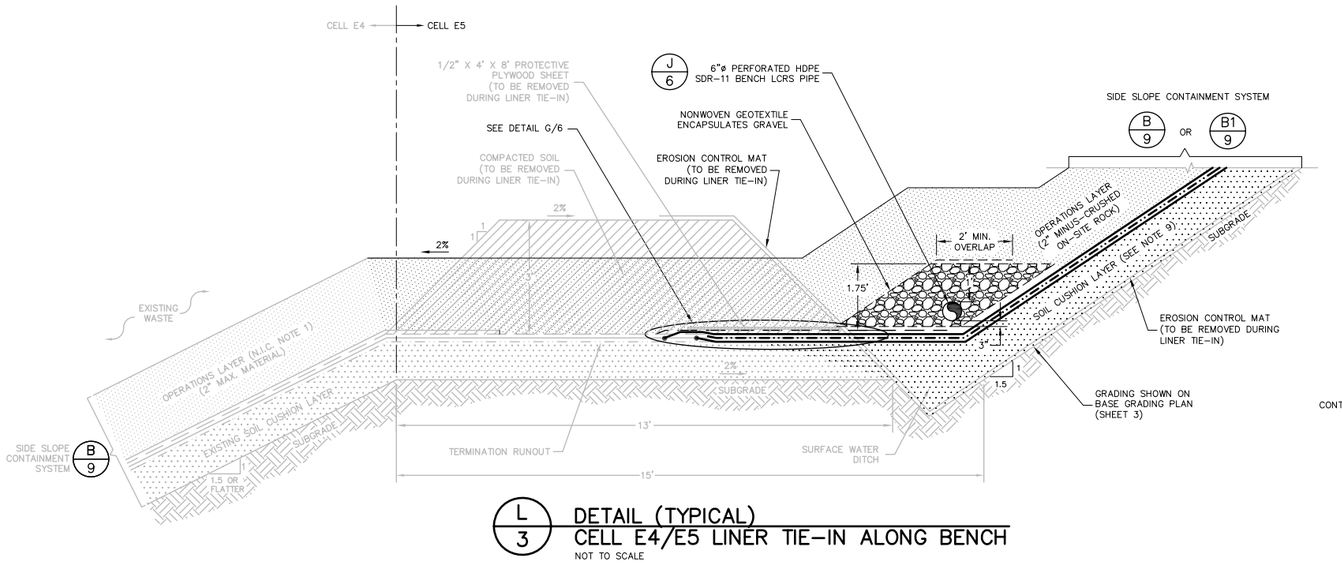
CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

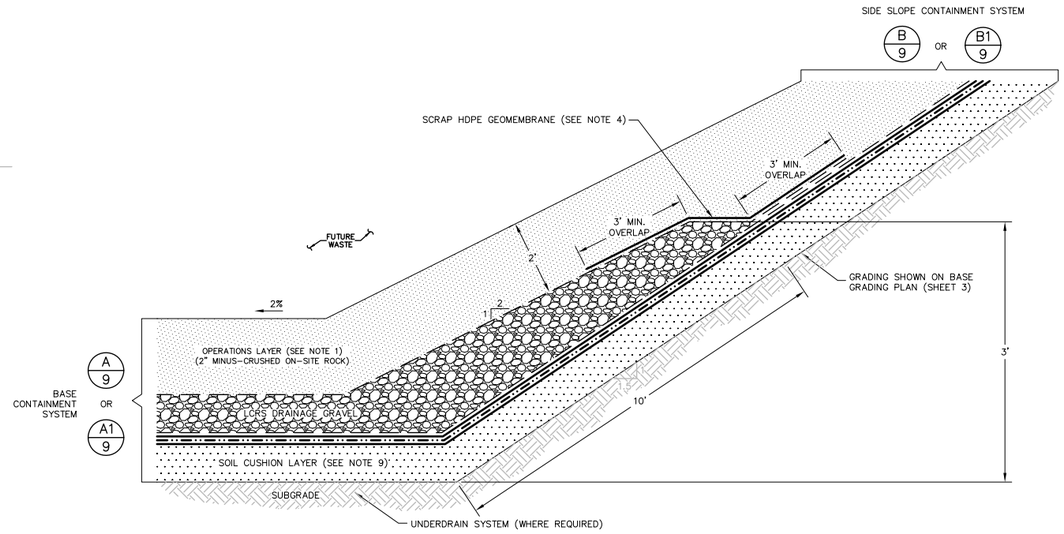
DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	FILE:

SHEET NO. 6

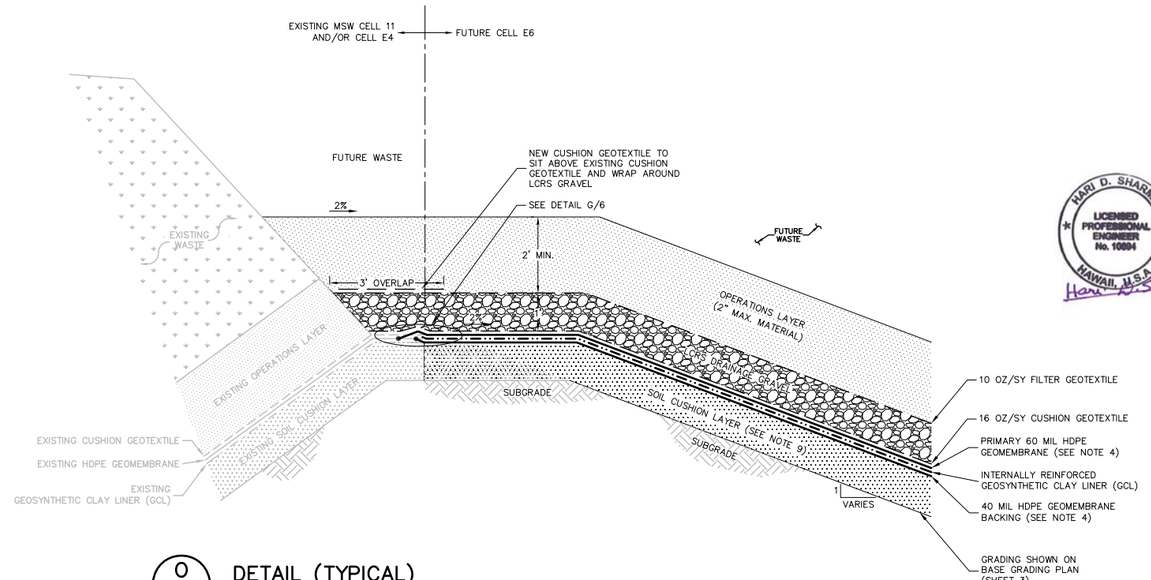
P:\CAD\Land Projects 3\WM\Waimanalo\Dwg\Cells E5-E8 and Partial West Berm Construction\E5-6-DETAILS CONSTRUCTION LEVEL_REV.dwg 1-13-10 CBlang



L/3 DETAIL (TYPICAL)
CELL E4/E5 LINER TIE-IN ALONG BENCH
NOT TO SCALE



M/3/4 DETAIL (TYPICAL)
BASE TO SIDE SLOPE LINER TRANSITION ALONG FLOOR
NOT TO SCALE



O/3 DETAIL (TYPICAL)
WEST SLOPE TIE-IN TO EXISTING MSW CELL 11
COMPOSITE LINER TO ENCAPSULATED LINER CONNECTION
NOT TO SCALE

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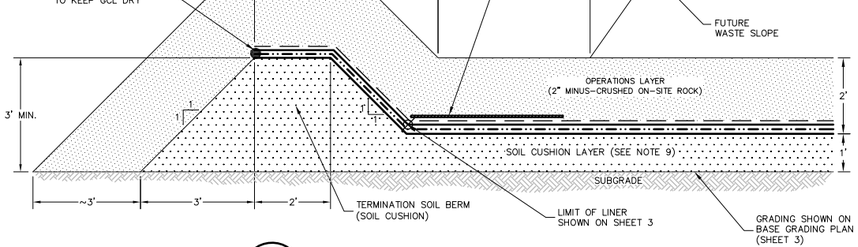
Hari D. Sharma



N/3/4 DETAIL (TYPICAL)
SIDE SLOPE LINER TERMINATION
NOT TO SCALE

NOTES:

1. CONTRACTOR TO PLACE OPERATIONS LAYER ON FLOOR, BENCHES AND 10 FEET ALONG THE SIDE SLOPE LENGTH ABOVE THE FLOOR OR BENCH. OWNER TO PLACE OPERATIONS LAYER SOIL ON SIDE SLOPE BEYOND THE 10-FT REQUIREMENT IN THIS CONTRACT IN COORDINATION WITH WASTE PLACEMENT. OPERATIONS LAYER SHALL MEET REQUIREMENTS FOR PERMEABILITY AND GRADATION IN THE SPECIFICATIONS. THE MAXIMUM OPERATING WEIGHT OF THE EQUIPMENT USED BY THE CONTRACTOR (DURING CONSTRUCTION) AND BY THE OWNER (DURING OPERATIONS) TO PLACE OPERATIONS LAYER SHALL BE A CATERPILLAR D3C LGP OR EQUIVALENT. NO BRAKING IS ALLOWED WHEN PLACING OPERATIONS LAYER SOIL ALONG THE SIDESLOPES.

2. INSTALLER TO PROVIDE SANDBAGS AND OTHER METHODS TO PROTECT THE EXPOSED GEOSYNTHETICS FROM WIND UPLIFT AND SHALL SUBMIT THEIR PLAN FOR APPROVAL BY OPERATOR.

3. TERMINATION OF GEOSYNTHETICS SHOWN ON DRAWINGS ARE FOR POST-CONSTRUCTION ANCHOR TRENCH LOADS. INSTALLER/CONTRACTOR ARE RESPONSIBLE FOR MAINTAINING ANCHORAGE OF GEOSYNTHETICS DURING CONSTRUCTION UNTIL OWNER ACCEPTS THE WORK. AFTER CONSTRUCTION, OWNER IS RESPONSIBLE FOR ANCHORAGE UNTIL HDPE GEOMEMBRANE IS OVERLAIN BY PROTECTIVE OPERATIONS LAYER AS PART OF LANDFILLING OPERATIONS (SEE NOTES 1 AND 5).

4. FOR ALL CELLS, GEOMEMBRANE SHALL BE TEXTURED ON BOTH SIDES.

5. CONTRACTOR, WITH PRIOR APPROVAL FROM OWNER, TO DEPLOY SACRIFICIAL GEOMEMBRANE IN AREAS WHERE GEOTEXTILE CUSHION WILL BE EXPOSED FOR MORE THAN 60 DAYS. OWNER TO REMOVE SACRIFICIAL GEOMEMBRANE BEFORE PLACING OPERATIONS LAYER. SACRIFICIAL GEOSYNTHETICS, IF DEPLOYED, SHALL BE REMOVED BY THE OWNER DURING OPERATIONS.

6. SCREENED BACK FEATURES CORRESPOND TO EXISTING OR FUTURE LAYERS.

7. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION. EXTEND AND CONNECT NEW CONTAINMENT SYSTEM TO EXISTING CONTAINMENT SYSTEM AS NECESSARY TO MAINTAIN A CONTINUOUS CONTAINMENT SYSTEM; I.E., (A) WELD NEW GEOMEMBRANE TO EXISTING GEOMEMBRANE; (B) THE WELD SHALL BE A MINIMUM 4 FT AWAY FROM THE EDGE OF THE SLOPE; (C) OVERLAP THE NEW GCL A MINIMUM OF 2 FT OVER THE EXISTING GCL; AND (D) THE GEOTEXTILE SHALL BE SEWN. ALL WELDING, OVERLAPING, AND SEWING SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS.

8. INSTALLER TO STAGE DEPLOYMENT OF GEOSYNTHETICS SO THAT EQUIPMENT DOES NOT NEED TO DRIVE DIRECTLY OVER ALREADY DEPLOYED GEOSYNTHETIC CLAY LINER (GCL) OR GEOMEMBRANE. ALLOWED GROUND PRESSURES OVER GEOSYNTHETICS ARE PROVIDED IN THE SPECIFICATIONS AND MUST BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION. CONTRACTOR TO STAGE AND COORDINATE PLACEMENT OF DRAINAGE GRAVEL AND OPERATIONS LAYER SO THAT GCL, GEOMEMBRANE, AND GEOTEXTILES ARE NOT DRIVEN OVER UNLESS MATERIAL THICKNESSES LISTED IN THE SPECIFICATIONS ARE MET.

9. IF SOIL CUSHION LAYER CAN NOT BE PLACED ON THE SIDE SLOPES, THEN THE SUBGRADE SHALL RECEIVE GUNITE HAVING SURFACE PROJECTIONS LESS THAN 0.25 INCH TO RECEIVE GEOSYNTHETICS.

P:\CADD\Land Projects 31\WM\Waimanalo\dwg\Cells E5-E8 and Partial West Berm Construction\E5-E8-DETAILS CONSTRUCTION LEVEL_REV.dwg 1-13-10 CWang

REVISIONS

NO.	DESCRIPTION	DATE	BY

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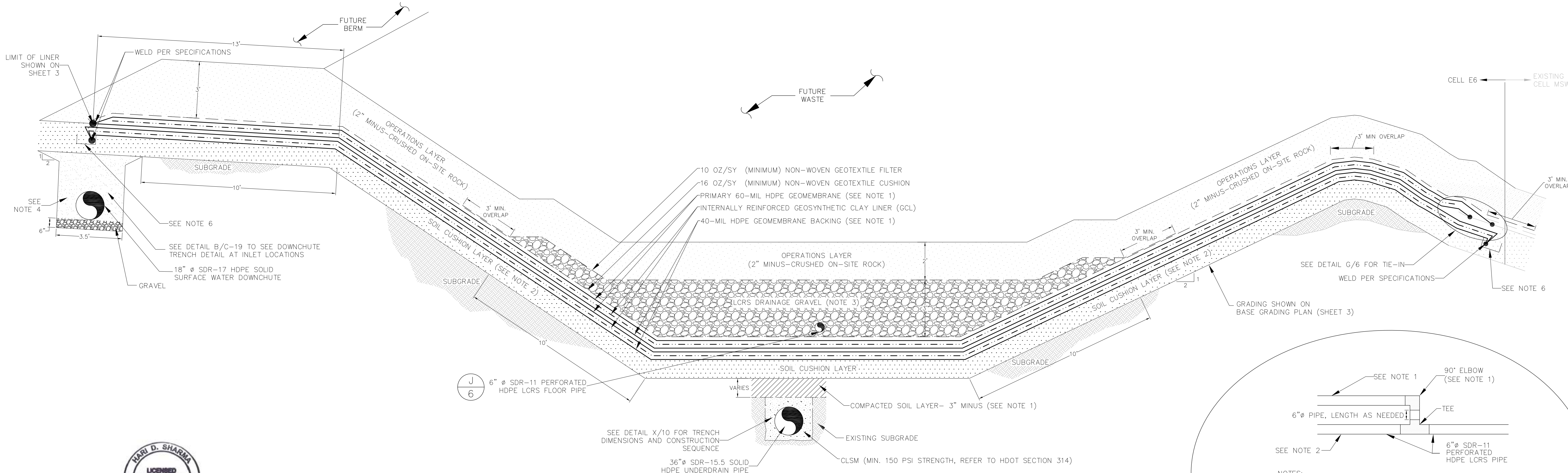
CONTAINMENT SYSTEM DETAILS III

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	FILE:

SHEET NO. 7



P/3 DETAIL (TYPICAL)
LCRS SUMP WEST-EAST DIRECTION
NOT TO SCALE

HARI D. SHARMA
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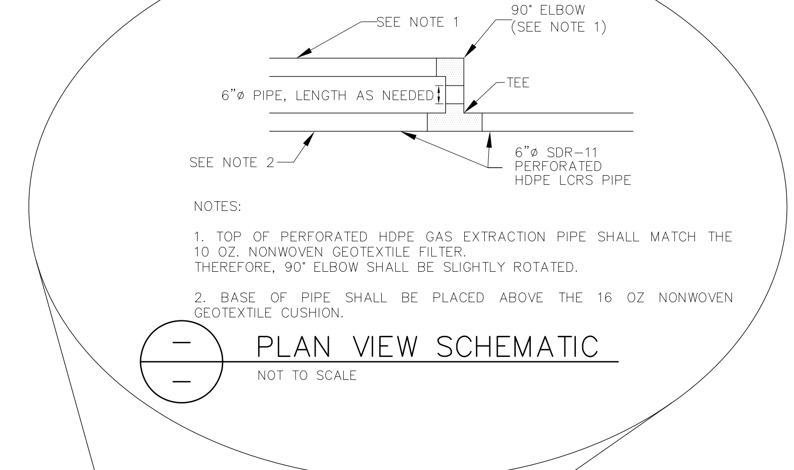
No. 10804
HAWAII, U.S.A.

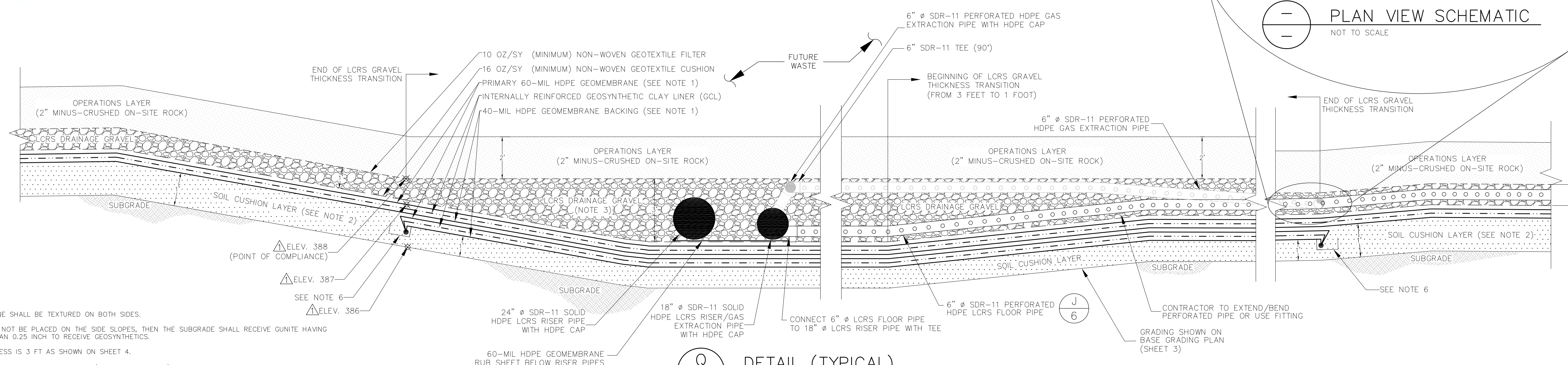


NOTES:

1. TOP OF PERFORATED HDPE GAS EXTRACTION PIPE SHALL MATCH THE 10 OZ. NONWOVEN GEOTEXTILE FILTER. THEREFORE, 90° ELBOW SHALL BE SLIGHTLY ROTATED.

2. BASE OF PIPE SHALL BE PLACED ABOVE THE 16 OZ NONWOVEN GEOTEXTILE CUSHION.

–/– PLAN VIEW SCHEMATIC
NOT TO SCALE



Q/3 DETAIL (TYPICAL)
LCRS SUMP ALONG LCRS FLOOR PIPE
NOT TO SCALE

NOTES:

1. FOR ALL CELLS, GEOMEMBRANE SHALL BE TEXTURED ON BOTH SIDES.

2. IF SOIL CUSHION LAYER CAN NOT BE PLACED ON THE SIDE SLOPES, THEN THE SUBGRADE SHALL RECEIVE GUNITE HAVING SURFACE PROJECTIONS LESS THAN 0.25 INCH TO RECEIVE GEOSYNTHETICS.

3. AREA WHERE GRAVEL THICKNESS IS 3 FT AS SHOWN ON SHEET 4.

4. PIPE SOIL BACKFILL SHALL BE SOIL CUSHION MATERIAL (SEE SECTION 02249) OR CONTROLLED LOW STRENGTH MATERIAL (CLSM). MATERIAL AND CONSTRUCTION METHODS FOR CLSM SHALL MEET A MINIMUM STRENGTH OF 150 PSI, AND OTHER REQUIREMENTS IN HDOT SECTION 314. MEASUREMENT AND PAYMENT FOR CLSM IS INCLUDED AS PART OF OTHER BID ITEMS; REFER TO SECTION 1025 OF THE CONTRACT DOCUMENTS.

5. THICKNESS OF COMPACTED SOIL FILL ALONG THE SUBDRAIN PIPE CORRIDOR ALIGNMENT WILL VARY. IN AREAS WHERE COMPACTED SOIL FILL IS REQUIRED TO REACH THE DESIGN BASE GRADES, SOIL SHALL BE PLACED IN ACCORDANCE WITH SECTION 02249 FROM THE TECHNICAL SPECIFICATIONS.

6. INSERT SECONDARY ENCAPSULATED LINER SYSTEM INTO 6" DEEP TERMINATION TRENCH AND BACKFILL WITH COMPACTED SOIL CUSHION.

P:\CADD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E6 and Partial West Berm Construction\E5-6-DETAILS CONSTRUCTION LEVEL_REV.dwg 2-11-10 CWang

REVISIONS

NO.	DESCRIPTION	DATE	BY
1	ADDED POINT OF COMPLIANCE	10 FEB 10	

WASTE MANAGEMENT

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Oakland, CA 94612

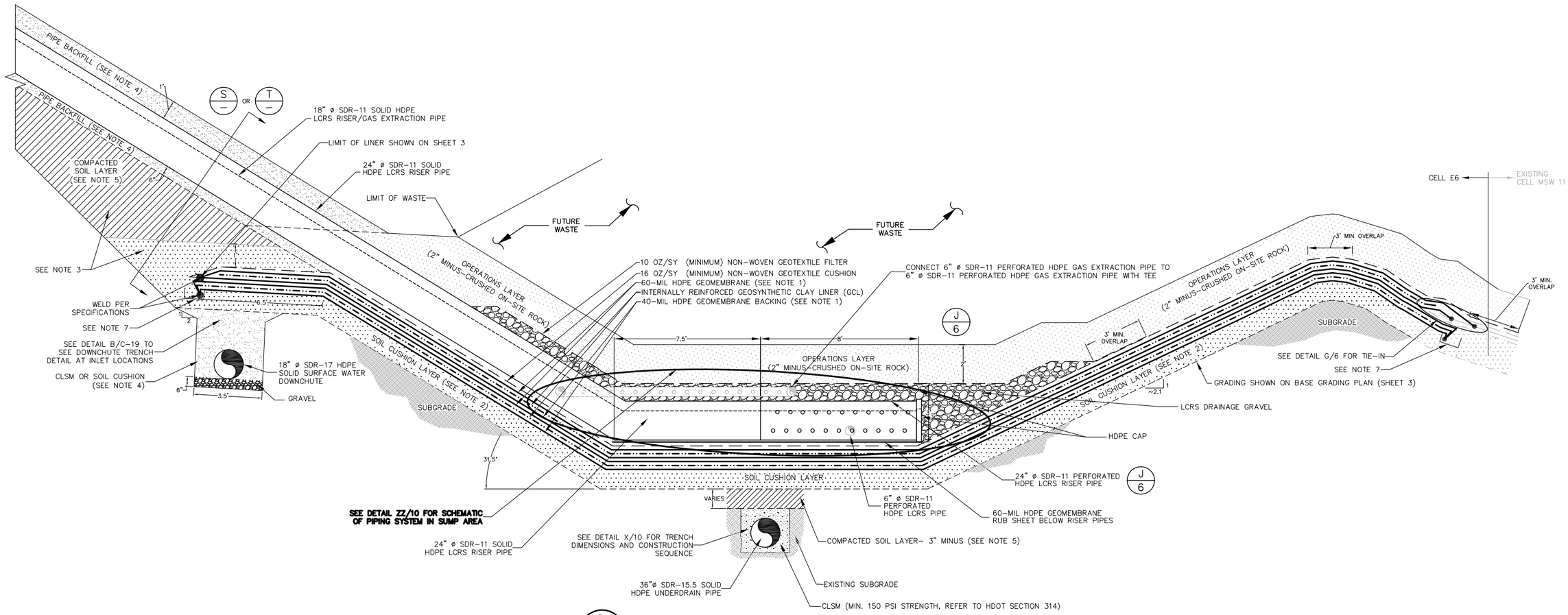
CONTAINMENT SYSTEM DETAILS IV

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

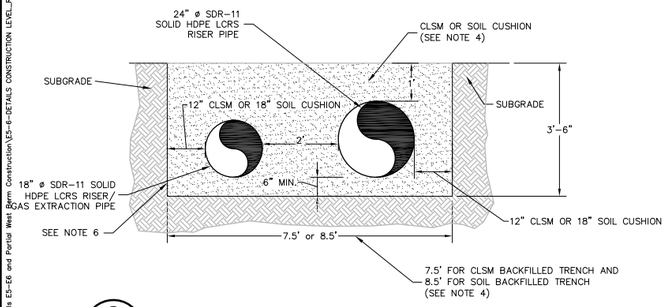
CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	
FILE:	

SHEET NO. 8



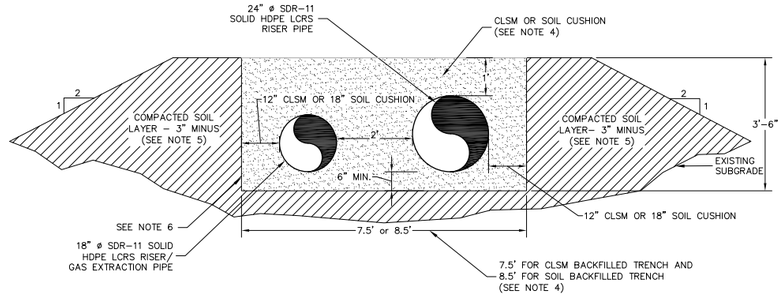
R/3 DETAIL (TYPICAL)
LCRS SUMP ALONG LCRS RISER PIPE TRENCH
NOT TO SCALE



S/– DETAIL (TYPICAL)
LCRS RISER PIPE TRENCH– CUT AREAS BELOW FUTURE WEST BERM
NOT TO SCALE

NOTES:

1. FOR ALL CELLS, GEOMEMBRANE SHALL BE TEXTURED ON BOTH SIDES.
2. SOIL CUSHION LAYER SHALL BE 1 FT THICK. IF SOIL CUSHION LAYER CAN NOT BE PLACED ON THE SIDE SLOPES, THEN THE SUBGRADE SHALL RECEIVE GUNITE HAVING SURFACE PROJECTIONS LESS THAN 0.25 INCH TO RECEIVE GEOSYNTHETICS.
3. MATERIAL SHOWN AS FILL. HOWEVER IN SOME AREAS, TRENCH CONSTRUCTION MAY REQUIRE EXCAVATION IN ROCK.
4. MATERIAL AND CONSTRUCTION METHODS FOR CONTROLLED LOW STRENGTH MATERIAL (CLSM) SHALL MEET A MINIMUM STRENGTH OF 150 PSI, AND OTHER REQUIREMENTS IN HDOT SECTION 314. MEASUREMENT AND PAYMENT FOR CLSM IS INCLUDED AS PART OF OTHER BID ITEMS; REFER TO SECTION 1025 OF THE CONTRACT DOCUMENTS.
5. THICKNESS OF COMPACTED SOIL FILL ALONG THE SUBDRAIN PIPE CORRIDOR ALIGNMENT WILL VARY. IN AREAS WHERE COMPACTED SOIL FILL IS REQUIRED TO REACH THE DESIGN BASE GRADES, SOIL SHALL BE PLACED IN ACCORDANCE WITH SECTION 02249 FROM THE TECHNICAL SPECIFICATIONS.
6. CONTRACTOR MAY NEED TO FLATTEN TRENCH SLOPES OR USE SHORING AS REQUIRED.
7. INSERT SECONDARY ENCAPSULATED LINER SYSTEM INTO 6" DEEP TERMINATION TRENCH AND BACKFILL WITH COMPACTED SOIL CUSHION.



T/– DETAIL (TYPICAL)
LCRS RISER PIPE TRENCH– FILL AREAS BELOW FUTURE WEST BERM
NOT TO SCALE

P:\CAD\Liquid Projects 3\WM\Waimanalo\Dwg\Cells E5-E8 and Partial West Berm Construction\E5-8-DETAILS CONSTRUCTION LEVEL_REV.dwg 1-13-10 OMeng

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

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Oakland, CA 94612

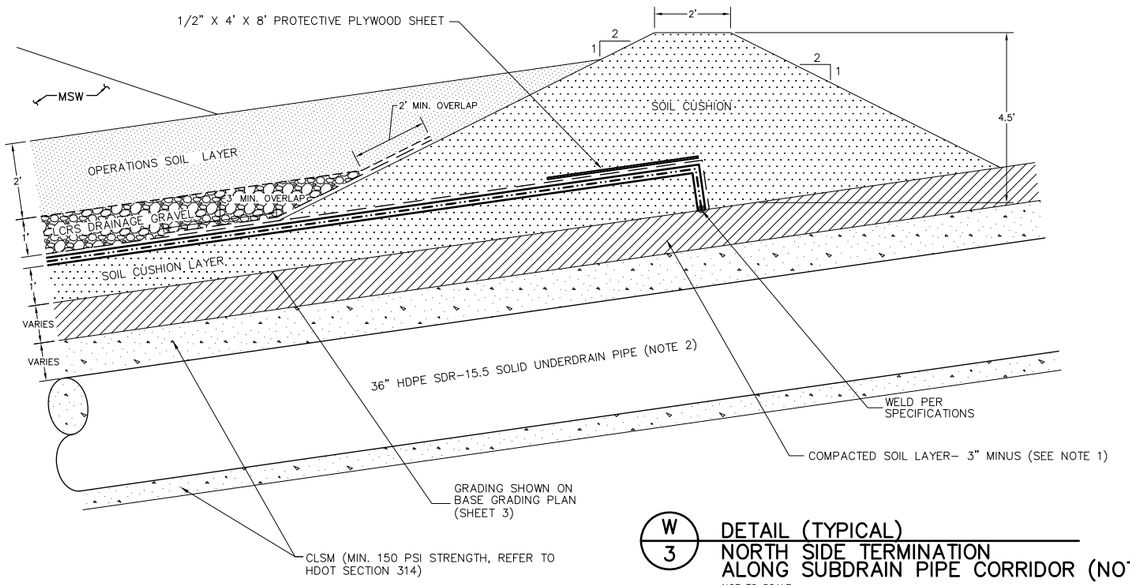
CONTAINMENT SYSTEM DETAILS V

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

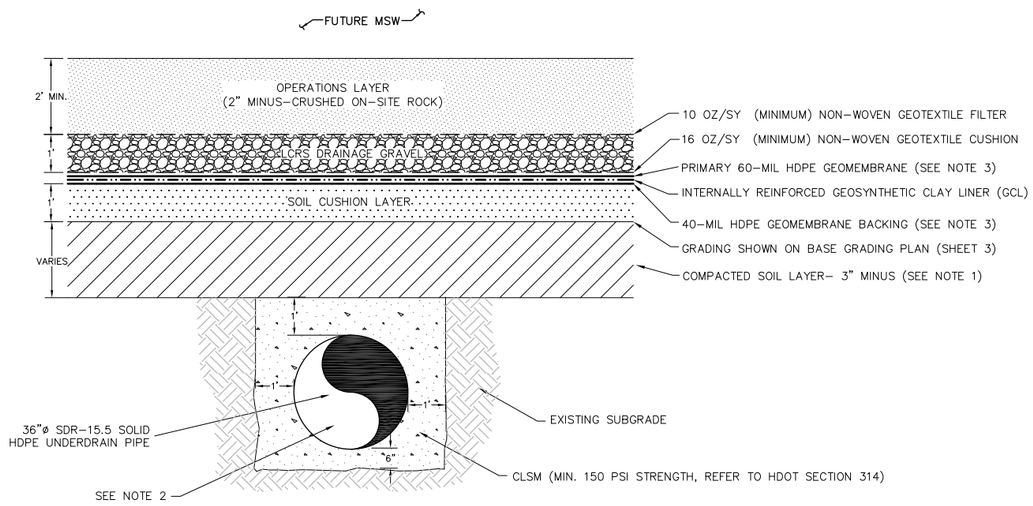
CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	FILE:

SHEET NO. 9



W/3 DETAIL (TYPICAL)
NORTH SIDE TERMINATION
ALONG SUBDRAIN PIPE CORRIDOR (NOTE 4)
NOT TO SCALE



X/3 DETAIL (TYPICAL)
FLOOR CONTAINMENT SYSTEM
ALONG SUBDRAIN PIPE CORRIDOR
NOT TO SCALE

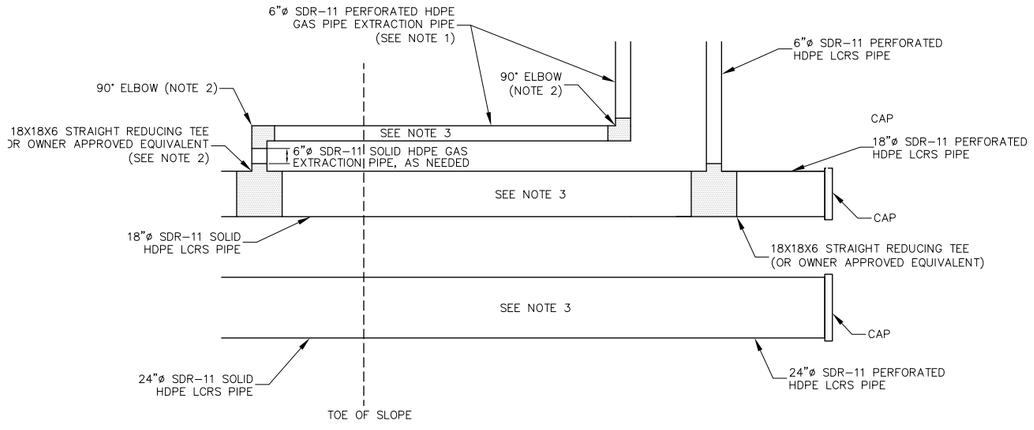
NOTES:

1. THICKNESS OF COMPACTED SOIL FILL ALONG THE SUBDRAIN PIPE CORRIDOR ALIGNMENT WILL VARY. IN AREAS WHERE COMPACTED SOIL FILL IS REQUIRED TO REACH THE DESIGN BASE GRADES, SOIL SHALL BE PLACED IN ACCORDANCE WITH SECTION 02249 FROM THE TECHNICAL SPECIFICATIONS.

2. BEFORE CONNECTING TO EXISTING 48" ø CMP, AND BEFORE BACKFILLING, PIPE SHALL BE TESTED FOR WATER TIGHTNESS AND LEAKS.

3. FOR ALL CELLS, GEOMEMBRANE SHALL BE TEXTURED ON BOTH SIDES.

4. IN CASE CELL IS CONSTRUCTED IN STAGES.



NOTES:

1. TOP OF PIPE SHALL MATCH THE 10 OZ. NONWOVEN GEOTEXTILE FILTER.

2. STRAIGHT REDUCING TEE AND 90° ELBOW SHALL BE SLIGHTLY ROTATED TO ALLOW 6" SOLID GAS PIPE TO BRIDGE THE 6" PERFORATED GAS PIPE TO THE 18" SOLID LCRS RISER.

3. PERFORATED/SOLID PIPE DIMENSIONING SHOWN ON SHEET 9, DETAIL R/3.

ZZ/9 PLAN VIEW SCHEMATIC
NOT TO SCALE

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10884
HAWAII, U.S.A.
Hari D. Sharma

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants
475 14th Street
Suite 400
Oakland, CA 94612

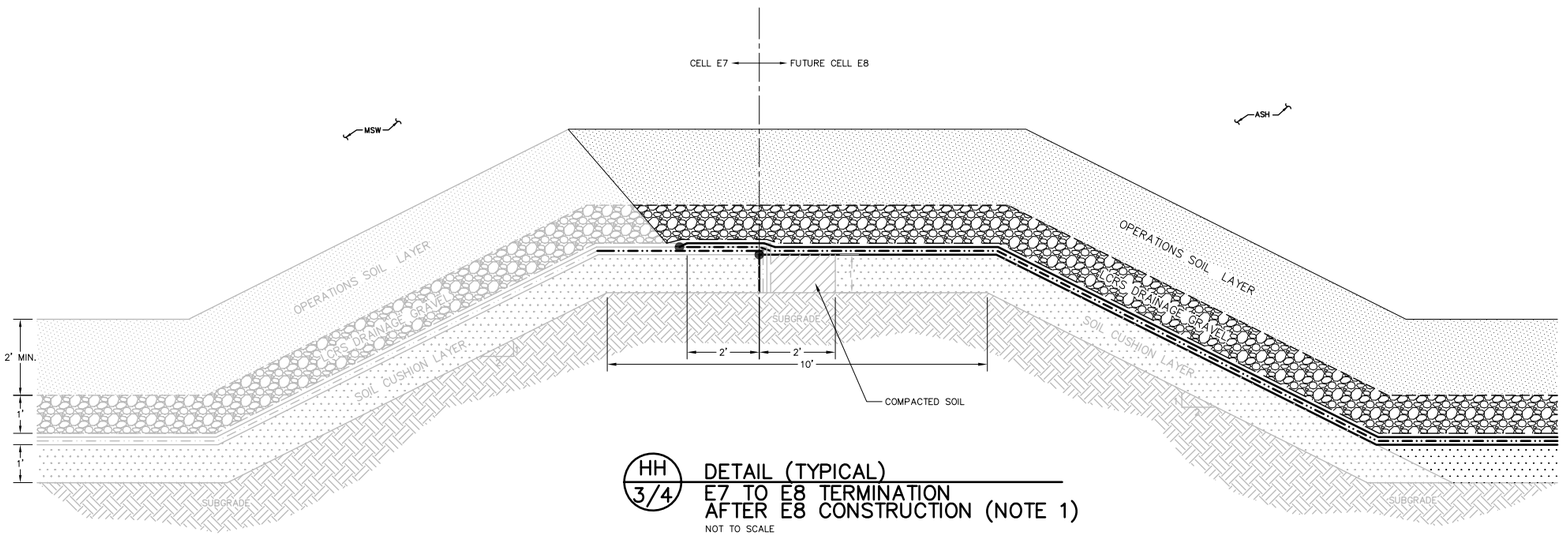
CONTAINMENT SYSTEM DETAILS VI
CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	FILE:

SHEET NO. 10

P:\CAD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E8 and Partial West Berm Construction\E5-6-DETAILS CONSTRUCTION LEVEL_REV.dwg 1-13-10 CMeng



HH 3/4 DETAIL (TYPICAL)
E7 TO E8 TERMINATION
AFTER E8 CONSTRUCTION (NOTE 1)
NOT TO SCALE

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10804
HAWAII, U.S.A.

NOTES:

1. FOR INITIAL GRADING, BERM WILL BE APPROXIMATELY 10 FT HIGH; FOR LINING, BERM WILL BE REDUCED TO 5 FT HIGH.

P:\CAD\Land Projects 3\WM Waimanalo\Jeng\Cells E5-E8 and Partial West Berm Construction\E5-E8 DETAILS CONSTRUCTION LEVEL_JEV.dwg 1-13-10 Chheng

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants
475 14th Street
Suite 400
Oakland, CA 94612

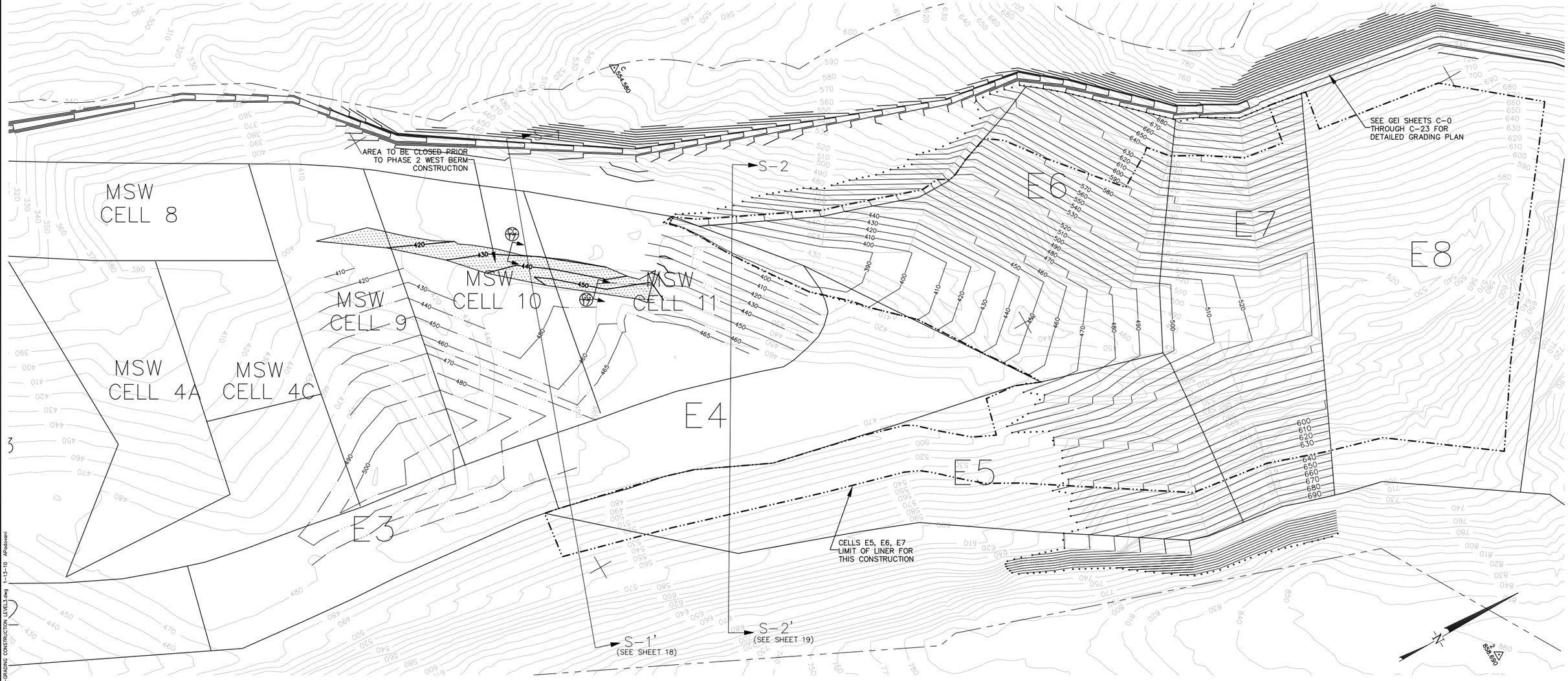
CONTAINMENT SYSTEM DETAILS VII

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	
FILE:	

SHEET NO.
11



NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER.

2. THE LOCATION OF TIE-IN TO EXISTING LINER SHOWN IS APPROXIMATE. ACTUAL LOCATION OF TIE-IN SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND MAY VARY FROM LAYOUT SHOWN. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION, AND EXTEND AND CONNECT NEW LINER SYSTEM COMPONENTS TO EXISTING AS NECESSARY TO MAINTAIN LINER SYSTEM CONTINUITY.

3. GRADES ALONG TIE-IN MAY BE ADJUSTED AS NEEDED TO MATCH EXISTING SUBGRADE CONDITIONS WITH APPROVAL BY THE ENGINEER.

4. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.

5. BEFORE, DURING, AND AFTER STORM EVENTS DURING CONSTRUCTION, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.

6. BENCHES THAT WILL NOT RECEIVE LINER SHALL BE LOCALLY GRADED SO THAT WATER FLOWS AWAY FROM LANDFILL.

7. IF COLLUVIUM OR ALLUVIUM ARE ENCOUNTERED DURING EXCAVATION, SLOPES SHALL BE RE-EVALUATED AND MAY NEED TO BE FLATTENED.

8. A SUBDRAIN PIPE MAY BE REQUIRED TO COLLECT SEEPS. SEEPS TO BE IDENTIFIED BY A GEOLOGIST. SUBDRAIN PIPE MAY NEED TO BE EXTENDED PAST THE LIMITS CURRENTLY SHOWN.

9. SLOPES SHALL BE EXCAVATED FROM TOP DOWN. CONTRACTOR SHALL ALLOW A GEOLOGIST TO ACCESS THE EXCAVATED SLOPES FOR GEOLOGIC MAPPING AND TO CONFIRM THAT THE SLOPES WILL BE STABLE.

NOTES (CONT.):

10. PLACE MSW FILL IN CELLS 9, 10 AND 11, AND CONSTRUCT FINAL COVER TO THE LIMITS SHOWN.

11. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE-GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.
LOCATION OF EXISTING UTILITIES SHALL BE CLEARLY MARKED BY FLAGGED 4-FT HIGH WOODEN STAKES AT 100-FT INTERVALS AND PAINT ON THE GROUND SURFACE. NEARER INTERVALS MAY BE REQUIRED BASED ON FIELD CONDITIONS. CONTRACTOR SHALL MONITOR AND MAINTAIN THE MARKINGS DURING THE CONSTRUCTION PROJECT UNTIL FINAL ACCEPTANCE OF THE WORK BY THE OWNER/OPERATOR.

12. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CITY, STATE AND FEDERAL HEALTH AND SAFETY REQUIREMENTS TO GUARD AND PROTECT ALL WORKERS, PEDESTRIANS, AND THE PUBLIC FROM EXCAVATIONS, BLASTING OPERATIONS, CONSTRUCTION EQUIPMENT, TRAFFIC, CONSTRUCTION OPERATIONS, ALL OBSTRUCTIONS, AND OTHER DANGEROUS ITEMS (E.G., LANDFILL GAS) OR AREAS. A HEALTH AND SAFETY PLAN IS REQUIRED AS PART OF THE WORK.

13. EXPECTED TO BE CONSTRUCTED BETWEEN 2010 AND 2014. CELL BOUNDARY AND/OR LIMIT OF FUTURE WASTE FILL IN CELLS E5 THROUGH E8 MAY CHANGE DEPENDING ON FUTURE WASTE STREAM.

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10894
HAWAII, U.S.A.

LEGEND

- 440 — STAGE 1 MSW GRADES 10-FT CONTOUR (MSL)
- AREA TO BE CLOSED PRIOR TO PHASE 2 WEST BERM
- 480 — CELLS E5 THROUGH E7 BASE GRADE 10-FT CONTOUR (MSL)
- 800 — EXISTING GROUND 10-FT CONTOUR (MSL)
- 500 — CELL E4 WASTE GRADES 10-FT CONTOUR (MSL)
- 288.16 — EXISTING BENCHMARK
- CELL BOUNDARY
- PROPERTY LINE
- APPROXIMATE LIMIT OF EARTHWORK
- APPROXIMATE CELLS E5 THROUGH E8 LINER LIMIT (NOTE 13)
- S-1 S-1' — CROSS SECTION LINE

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants

475 14th Street
Suite 400
Oakland, CA 94612

STAGE 1 MSW PLACEMENT PRIOR TO PHASE 2 WEST BERM

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS		
DES BY: ACP	DATE:	JANUARY 2010
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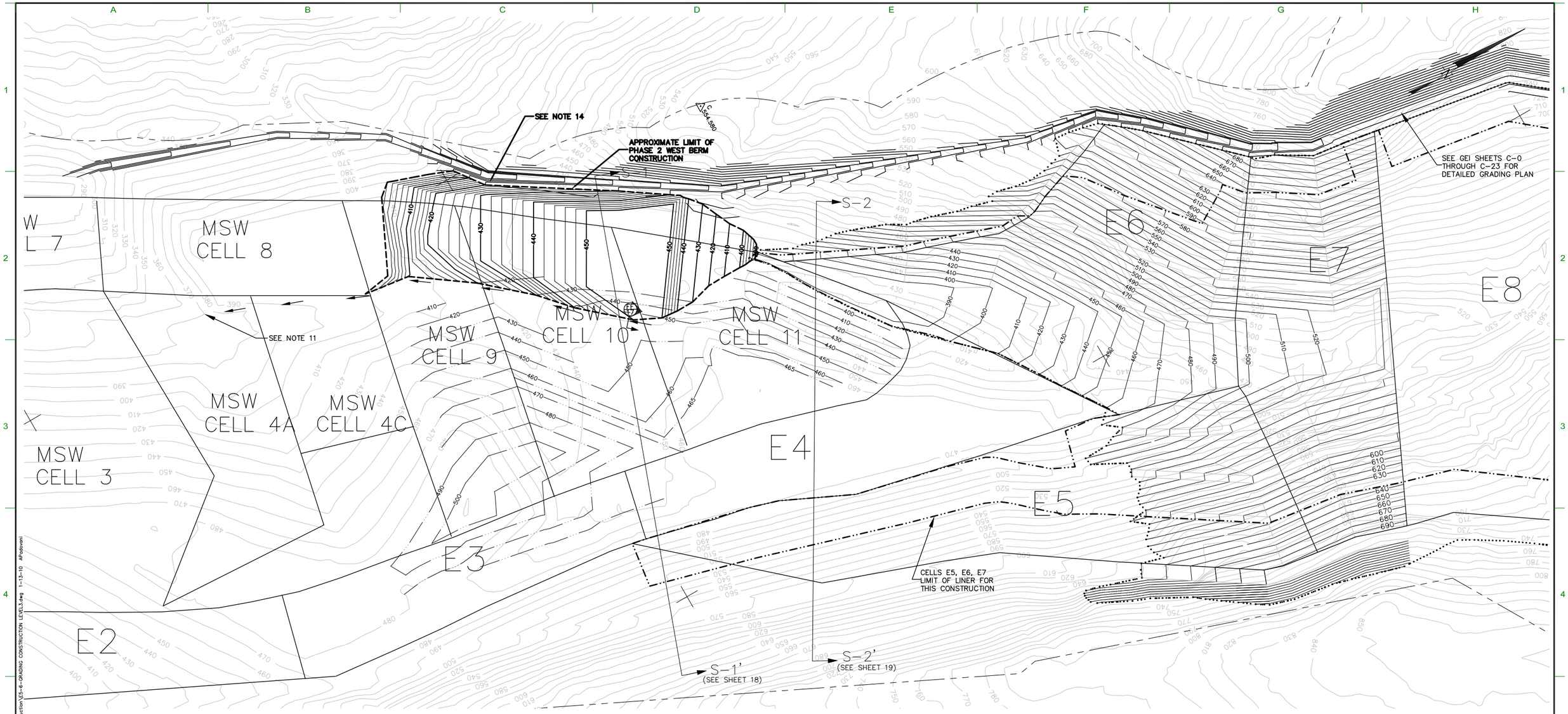
FILE:		

SHEET NO.
12

P:\CADD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E8 and Partial West Berm Construction\E5-E8-GRADING CONSTRUCTION LEVEL3.dwg 1-13-10 APadovani



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4. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.

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6. BENCHES THAT WILL NOT RECEIVE LINER SHALL BE LOCALLY GRADED SO THAT WATER FLOWS AWAY FROM LANDFILL.

7. SURFACE WATER SWALE SHALL BE BUILT WHERE THE WEST BERM MEETS THE EXISTING MSW. RIPRAP WITH A D_{50}= 12 INCHES SHOULD BE PLACED TO 5 FEET OF EITHER SIDE OF THE INTERSECTION AS PROTECTION AGAINST EROSION. SEE FF/17 FOR CONSTRUCTION DETAIL.

8. THE BERM IS TO BE KEYED INTO THE COMPETENT NATIVE SUBGRADE IN A STEP CONFIGURATION.

9. CONSTRUCT PHASE 2 WEST BERM TO THE GRADES AND LIMITS SHOWN.

10. WASTE FILL CANNOT BE PLACED ABOVE GRADES SHOWN UNTIL PHASE 2 WEST BERM HAS BEEN CONSTRUCTED.

NOTES (CONT.):

11. CONNECT NEW SURFACE WATER SWALE TO EXISTING DRAINAGE FEATURES (I.E. SWALE AND/OR DITCH) TO ENSURE PROPER DISCHARGE.

12. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE–GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.

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14. CONTRACTOR TO TIE WEST BERM FILL GRADES TO TOPOGRAPHY AND/OR WESTERN DRAINAGE SYSTEM'S RIGHT OF WAY AND PROVIDE AN AS–BUILT SURVEY FOR APPROVAL BY ENGINEER.

15. EXPECTED TO BE CONSTRUCTED BETWEEN 2010 AND 2014. CELL BOUNDARY AND/OR LIMIT OF FUTURE WASTE FILL IN CELLS E5 THROUGH E8 MAY CHANGE DEPENDING ON FUTURE WASTE STREAM.

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10004
HAWAII, U.S.A.

LEGEND

- 450 — PHASE 2 WEST BERM GRADES 10–FT CONTOUR (MSL)
- PHASE 2 WEST BERM GRADES 2–FT CONTOUR (MSL)
- APPROXIMATE LIMIT OF PHASE 2 WEST BERM
- 480 — CELLS E5 THROUGH E7 BASE GRADE 10–FT CONTOUR (MSL)
- 800 — EXISTING GROUND 10–FT CONTOUR (MSL)
- 460 — EXISTING MSW GRADES PRIOR TO PHASE 2 WEST BERM
- 4 288.16 — EXISTING BENCHMARK
- CELL BOUNDARY
- PROPERTY LINE
- APPROXIMATE LIMIT OF EARTHWORK
- APPROXIMATE CELLS E5 THROUGH E8 LINER LIMIT (NOTE 15)
- SURFACE WATER FLOW DIRECTION
- S–1 S–1' — CROSS SECTION LINE

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants

475 14th Street
Suite 400
Oakland, CA 94612

PHASE 2 WEST BERM PRIOR TO STAGE 2 MSW PLACEMENT

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
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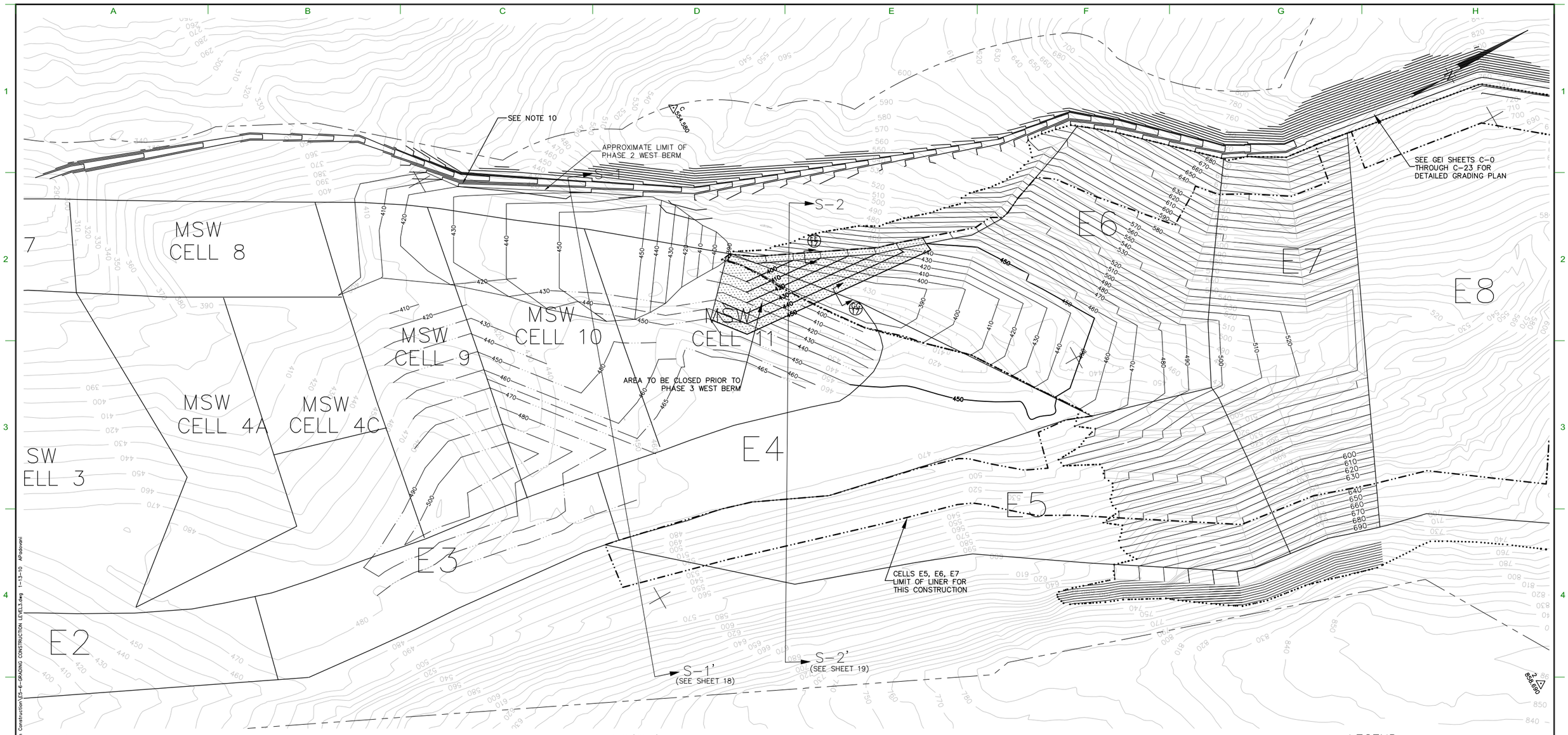
FILE:	

SHEET NO.
13

P:\CAD\Land Projects 3\WM\Waimanalo\Mxd\Cells E5–E6 and Partial West Berm Construction\E5–E6–GRADING CONSTRUCTION LEVEL3.dwg 1–13–10 APodlovani



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6. BENCHES THAT WILL NOT RECEIVE LINER SHALL BE LOCALLY GRADED SO THAT WATER FLOWS AWAY FROM LANDFILL.

7. PLACE MSW FILL IN CELLS 11 AND E6, AFTER PHASE 2 WEST BERM HAS BEEN CONSTRUCTED, AND CONSTRUCT FINAL COVER TO THE LIMITS SHOWN.

8. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE-GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.

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11. EXPECTED TO BE CONSTRUCTED BETWEEN 2010 AND 2014. CELL BOUNDARY AND/OR LIMIT OF FUTURE WASTE FILL IN CELLS E5 THROUGH E8 MAY CHANGE DEPENDING ON FUTURE WASTE STREAM.

HARI D. SHARMA LICENSED PROFESSIONAL ENGINEER No. 10884 HAWAII, U.S.A.

LEGEND

- STAGE 2 MSW GRADES 10-FT CONTOUR (MSL)
- AREA TO BE CLOSED PRIOR TO PHASE 3 WEST BERM
- CELLS E5 THROUGH E7 BASE GRADE 10-FT CONTOUR (MSL)
- EXISTING GROUND 10-FT CONTOUR (MSL)
- EXISTING MSW GRADES
- EXISTING BENCHMARK
- CELL BOUNDARY
- PROPERTY LINE
- APPROXIMATE LIMIT OF EARTHWORK
- APPROXIMATE CELLS E5 THROUGH E8 LINER LIMIT (NOTE 11)
- PHASE 2 WEST BERM GRADES
- CROSS SECTION LINE (S-1 / S-1')

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants
475 14th Street
Suite 400
Oakland, CA 94612

STAGE 2 MSW PLACEMENT PRIOR TO PHASE 3 WEST BERM

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
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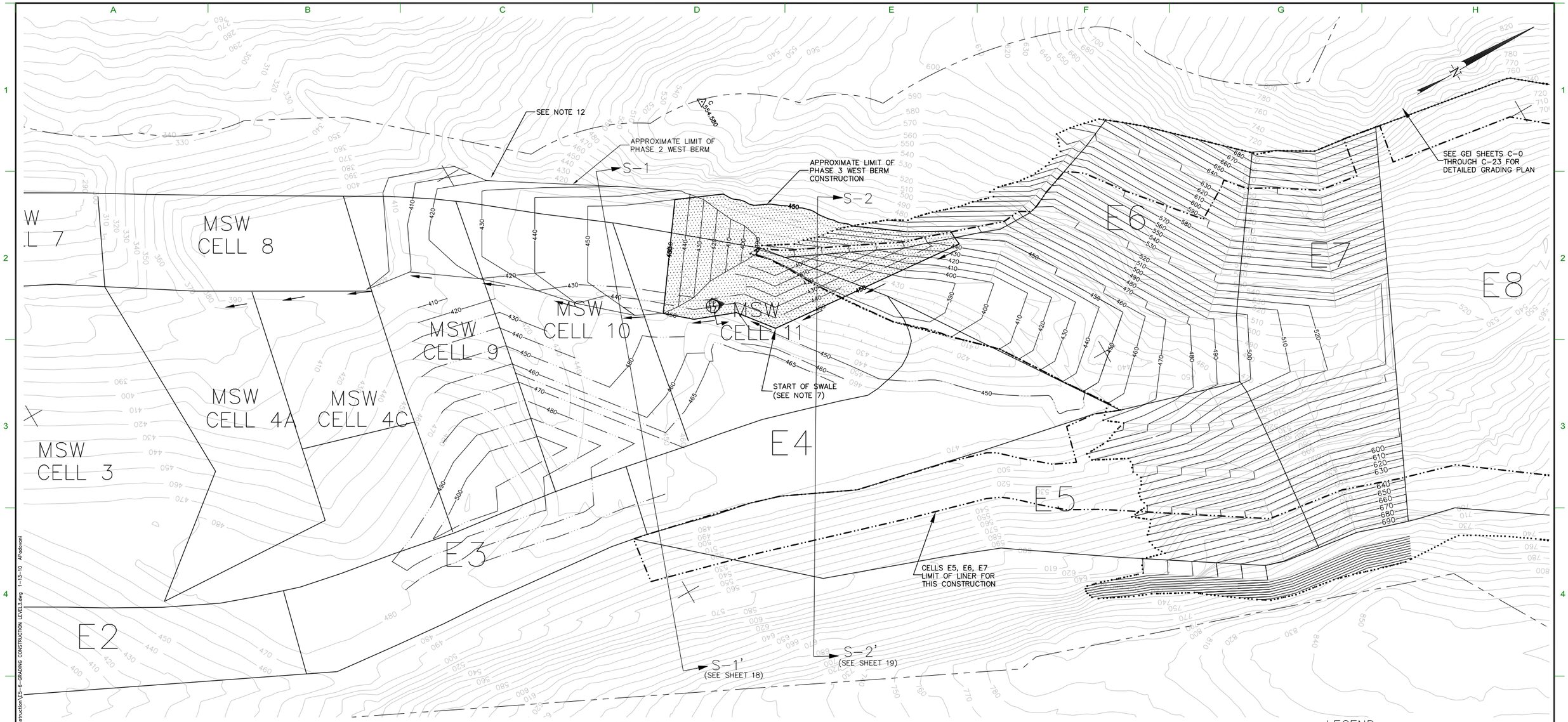
SHEET NO. 14

P:\CADD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E8 and Partial West Berm Construction\E5-E6-GRADING CONSTRUCTION LEVEL3.dwg 1-13-10 APradovani



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8. THE BERM IS TO BE KEYED INTO THE COMPETENT NATIVE SUBGRADE IN A STEP CONFIGURATION.

9. CONSTRUCT PHASE 3 WEST BERM TO THE GRADES AND LIMITS SHOWN.

NOTES (CONT.):

10. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE-GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.

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HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10004
HAWAII, U.S.A.

LEGEND

- 450 — PHASE 3 WEST BERM GRADES 10-FT CONTOUR (MSL)
- APPROXIMATE LIMIT OF PHASE 3 WEST BERM
- 480 — CELLS E5 THROUGH E7 BASE GRADE 10-FT CONTOUR (MSL)
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- PHASE 2 WEST BERM GRADES
- SURFACE WATER FLOW DIRECTION
- S-1 S-1' — CROSS SECTION LINE

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants

475 14th Street
Suite 400
Oakland, CA 94612

PHASE 3 WEST BERM PRIOR TO STAGE 3 MSW PLACEMENT

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
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CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
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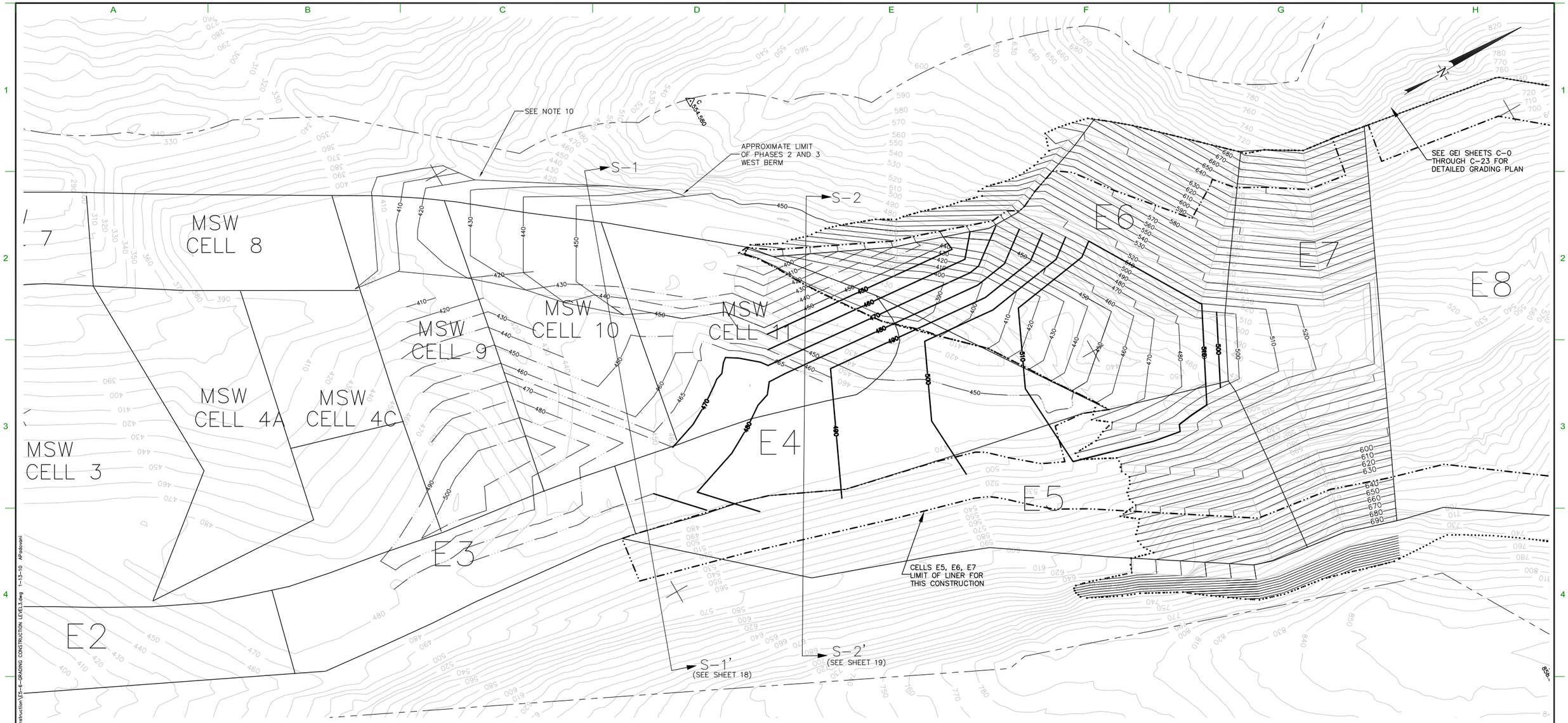
SHEET NO. 15

P:\CADD\Land Projects 3\WM Waimanalo\dwg\Cells E5-E8 and Partial West Berm Construction\E5-E8 GRADING CONSTRUCTION LEVELS.dwg 1-13-10 APadovani



NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER.

2. THE LOCATION OF TIE–IN TO EXISTING LINER SHOWN IS APPROXIMATE. ACTUAL LOCATION OF TIE–IN SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND MAY VARY FROM LAYOUT SHOWN. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION, AND EXTEND AND CONNECT NEW LINER SYSTEM COMPONENTS TO EXISTING AS NECESSARY TO MAINTAIN LINER SYSTEM CONTINUITY.

3. GRADES ALONG TIE–IN MAY BE ADJUSTED AS NEEDED TO MATCH EXISTING SUBGRADE CONDITIONS WITH APPROVAL BY THE ENGINEER.

4. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.

5. BEFORE, DURING, AND AFTER STORM EVENTS, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.

6. BENCHES THAT WILL NOT RECEIVE LINER SHALL BE LOCALLY GRADED SO THAT WATER FLOWS AWAY FROM LANDFILL.

7. PLACE MSW FILL IN CELLS 11, E4, E5 AND E6, AFTER PHASE 3 WEST BERM HAS BEEN CONSTRUCTED, TO THE GRADES AND LIMITS SHOWN.

8. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE–GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.

LOCATION OF EXISTING UTILITIES SHALL BE CLEARLY MARKED BY FLAGGED 4–FT HIGH WOODEN STAKES AT 100–FT INTERVALS AND PAINT ON THE GROUND SURFACE. NEARER INTERVALS MAY BE REQUIRED BASED ON FIELD CONDITIONS. CONTRACTOR SHALL MONITOR AND MAINTAIN THE MARKINGS DURING THE CONSTRUCTION PROJECT UNTIL FINAL ACCEPTANCE OF THE WORK BY THE OWNER/OPERATOR.

9. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CITY, STATE AND FEDERAL HEALTH AND SAFETY REQUIREMENTS TO GUARD AND PROTECT ALL WORKERS, PEDESTRIANS, AND THE PUBLIC FROM EXCAVATIONS, BLASTING OPERATIONS, CONSTRUCTION EQUIPMENT, TRAFFIC, CONSTRUCTION OPERATIONS, ALL OBSTRUCTIONS, AND OTHER DANGEROUS ITEMS (E.G., LANDFILL GAS) OR AREAS. A HEALTH AND SAFETY PLAN IS REQUIRED AS PART OF THE WORK.

10. CONTRACTOR TO TIE WEST BERM FILL GRADES TO TOPOGRAPHY AND/OR WESTERN DRAINAGE SYSTEM'S RIGHT OF WAY AND PROVIDE AN AS–BUILT SURVEY FOR APPROVAL BY ENGINEER.

11. EXPECTED TO BE CONSTRUCTED BETWEEN 2010 AND 2014. CELL BOUNDARY AND/OR LIMIT OF FUTURE WASTE FILL IN CELLS E5 THROUGH E8 MAY CHANGE DEPENDING ON FUTURE WASTE STREAM.

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10804
HAWAII, U.S.A.

LEGEND

- 500 — STAGE 3 MSW GRADES 10–FT CONTOUR (MSL)
- 480 — CELLS E5 THROUGH E7 BASE GRADE 10–FT CONTOUR (MSL)
- 800 — EXISTING GROUND 10–FT CONTOUR (MSL)
- 440 — EXISTING MSW GRADES
- 4 / 288.16 — EXISTING BENCHMARK
- CELL BOUNDARY
- PROPERTY LINE
- APPROXIMATE LIMIT OF EARTHWORK
- APPROXIMATE CELLS E5 THROUGH E8 LINER LIMIT (NOTE 11)
- EXISTING WEST BERM GRADES
- S–1 S–1' — CROSS SECTION LINE

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants

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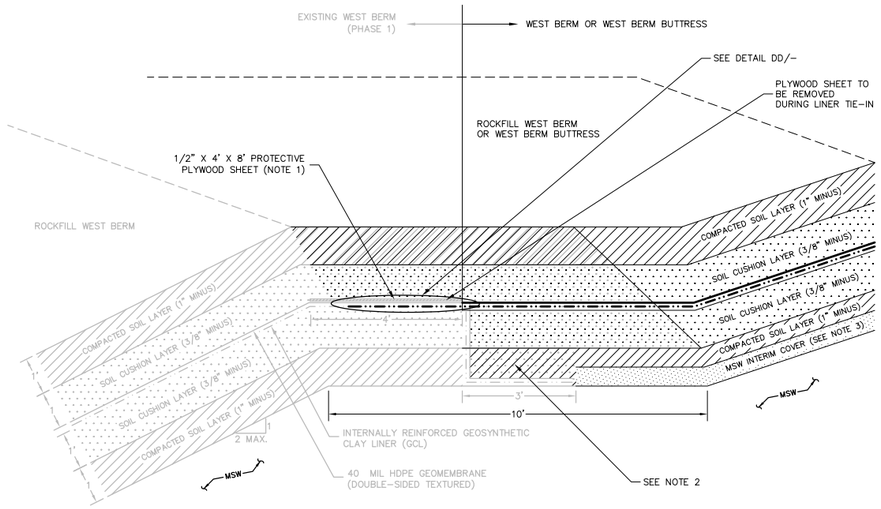
STAGE 3 MSW PLACEMENT ABOVE CELLS E5 AND E6

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

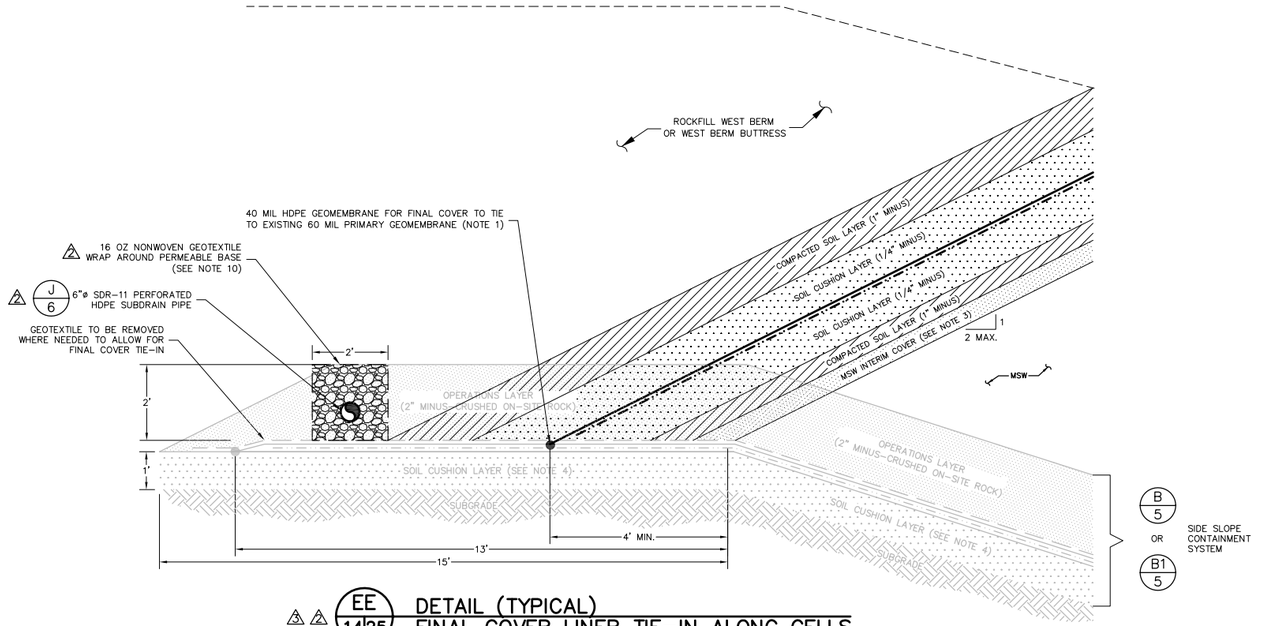
CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010	SHEET NO.	16
DRN BY: ACP	SCALE: AS SHOWN		
CHK BY: FWS	PROJECT: WL0770		
REV BY: HDS	DOCUMENT:		
APP BY: HDS	FILE:		

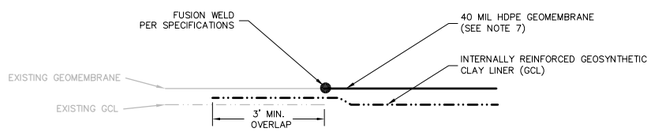
P:\CADD\Land Projects 3\WM\Waimanalo\dwg\Cells E5–E8 and Partial West Berm Construction\E5–6–GRADING CONSTRUCTION LEVELS.dwg 1–13–10 APadovani



3 2 CC 12 25 DETAIL (TYPICAL)
FINAL COVER LINER TIE–IN BELOW WEST BERM (SEE NOTE 11)
NOT TO SCALE

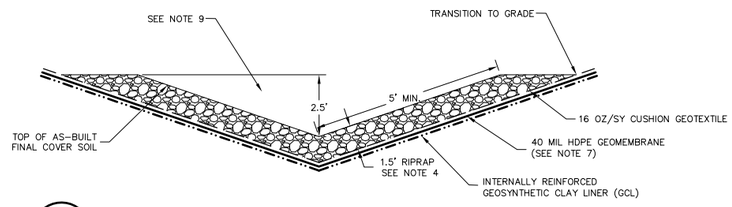


3 2 EE 14 25 DETAIL (TYPICAL)
FINAL COVER LINER TIE–IN ALONG CELLS MSW 11, E6, AND PORTIONS OF MSW 3, 4A, 7, 8 (SEE NOTE 11)
NOT TO SCALE

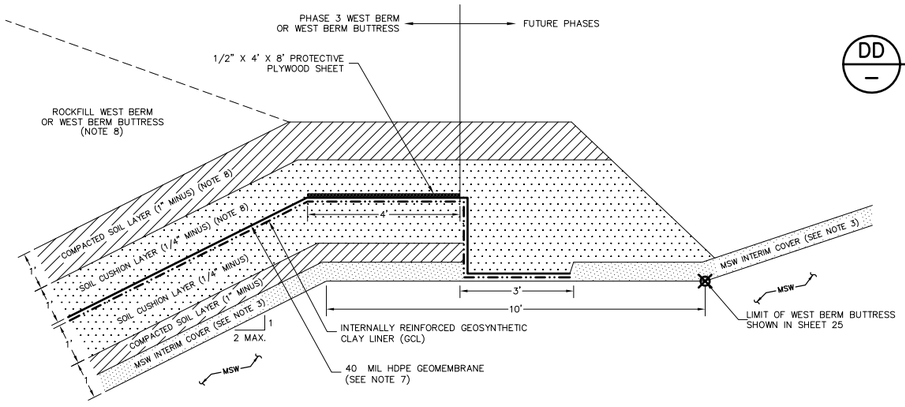


NOTES:
IF EXISTING GCL IS IN HYDRATED CONDITION, PLACE 18" WIDE GEOMEMBRANE STRIP ALONG EDGE OF EXISTING HYDRATED GCL BEFORE OVERLAPPING NEW GCL ON TOP OF EXISTING GCL.

DD – DETAIL (TYPICAL)
TIE–IN OVERLAP BELOW WEST BERM (NOTE 1)
NOT TO SCALE



2 FF 13 15 25 DETAIL (TYPICAL)
SURFACE WATER SWALE (NOTE 9)
NOT TO SCALE



3 2 GG 12 14 25 DETAIL (TYPICAL)
FINAL COVER LINER TERMINATION BELOW WEST BERM (NOTES 8 & 11)
NOT TO SCALE

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10004
HAWAII, U.S.A.
Hari D. Sharma

NOTES:

1. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM AND FINAL COVER TERMINATIONS IN THE AREA OF WEST BERM. EXTEND AND CONNECT NEW FINAL COVER SYSTEM TO EXISTING CONTAINMENT SYSTEM OR FINAL COVER SYSTEM AS NECESSARY TO MAINTAIN A CONTINUOUS CONTAINMENT SYSTEM I.E., (A) WELD NEW GEOMEMBRANE TO EXISTING GEOMEMBRANE; AND (B) OVERLAP THE NEW GCL A MINIMUM OF 3 FT OVER THE EXISTING GCL.

2. CONTRACTOR TO FIELD–VERIFY EXISTING LINER/FINAL COVER TERMINATIONS. IF CONDITIONS VARY, CHANGES TO DIMENSIONS MAY BE MADE UPON APPROVAL FROM THE ENGINEER.

3. EXISTING INTERIM COVER ABOVE MSW MAY ACCOUNT FOR A PORTION OF THE COMPACTED SOIL LAYER THICKNESS PROVIDED THE INTERIM COVER MATERIAL MEETS REQUIREMENTS IN THE SPECIFICATIONS FOR COMPACTED SOIL (I.E., COMPACTION AND GRADATION).

4. RIPRAP WITH A D_{50} = 12 INCHES SHOULD BE PLACED TO 5 FEET OF EITHER SIDE OF THE SURFACE WATER SWALE AS PROTECTION AGAINST EROSION. HORIZONTAL EXTENT OF SURFACE WATER SWALE AS SHOWN ON **SHEETS 4 AND 25**.

2 5. DURING CONSTRUCTION INSTALLER/CONTRACTOR MAY REQUIRE SAND BAGS TO ADDRESS WIND UPLIFT OF GEOSYNTHETICS.

6. SCREENED BACK FEATURES CORRESPOND TO EXISTING OR FUTURE LAYERS.

7. GEOMEMBRANES SHALL BE DOUBLE–SIDED TEXTURED.

8. (i) STAGING OF PLACEMENT OF SOIL CUSHION, COMPACTED SOIL, AND ROCKFILL SHALL BE NECESSARY.
(ii) CONTRACTOR SHALL ANCHOR THE GEOSYNTHETICS AND COMPLETE THE PLACEMENT OF OVERLYING COMPACTED SOIL AND CUSHION LAYERS ON THE BENCH PRIOR TO PLACEMENT OF OVERLYING SOIL CUSHION AND COMPACTED SOIL LAYERS ON THE SLOPE.
(iii) CONTRACTOR SHALL PLACE SOIL CUSHION LAYER ABOVE GEOMEMBRANE A MAXIMUM LENGTH OF 15 FEET MEASURED ALONG THE SLOPE. CONTRACTOR SHALL USE A CATERPILLAR D3C LGP OR EQUIVALENT TO PLACE SOIL CUSHION WITHOUT BRAKING.
(iv) CONTRACTOR SHALL PLACE COMPACTED SOIL LAYER AND ROCKFILL BERM TO BUTTRESS THE PREVIOUSLY PLACED SOIL CUSHION LAYER ABOVE THE GEOMEMBRANE.
(v) COMPACTED SOIL LAYER AND WEST BERM MATERIAL SHALL ONLY BE COMPACTED IN HORIZONTAL LAYERS AND NOT BE COMPACTED UP AND DOWN THE SLOPE.

9. CONTRACTOR TO BUILD SWALE TO DISCHARGE TO THE EXISTING SURFACE WATER SWALE AND/OR DITCH.

10. BACKFILL MATERIAL TO BE AS DESCRIBED IN HDOT SECTION 703.4(A) AGGREGATE FOR UNTREATED PERMEABLE BASE, COARSE AGGREGATE MODIFIED SIZE 4 OR EQUIVALENT APPROVED BY THE ENGINEER.

3 11. INTERFACE FRICTION TESTS SHALL BE CONDUCTED IN GENERAL ACCORDANCE WITH SECTION 02800 OF THE PROJECT SPECIFICATIONS.

REVISIONS			
NO.	DESCRIPTION	DATE	BY
2	WEST BERM BUTTRESS ADDITION	11 MAR 10	
3	TESTING REQUIREMENTS	16 MAR 10	ACP

WASTE MANAGEMENT

Geosyntec consultants

475 14th Street
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Oakland, CA 94612

WEST BERM FINAL COVER DETAILS I

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS		
DES BY: ACP	DATE: JANUARY 2010	SHEET NO. 17
DRN BY: ACP	SCALE: AS SHOWN	
CHK BY: FWS	PROJECT: WL0770	
REV BY: HDS	DOCUMENT:	
APP BY: HDS	FILE:	

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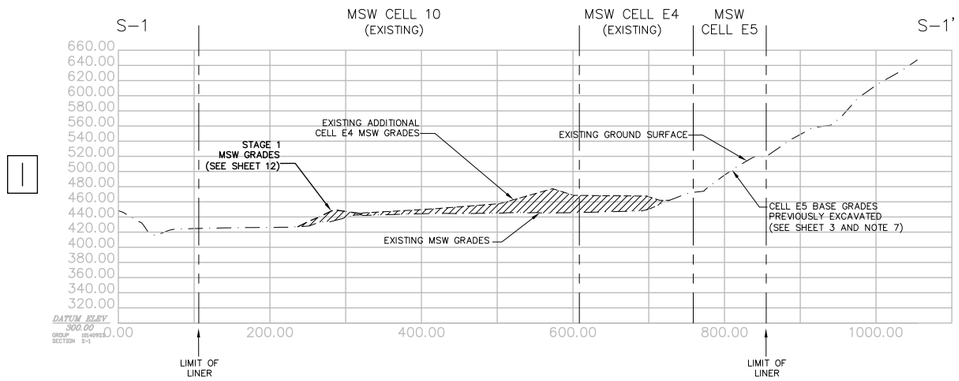
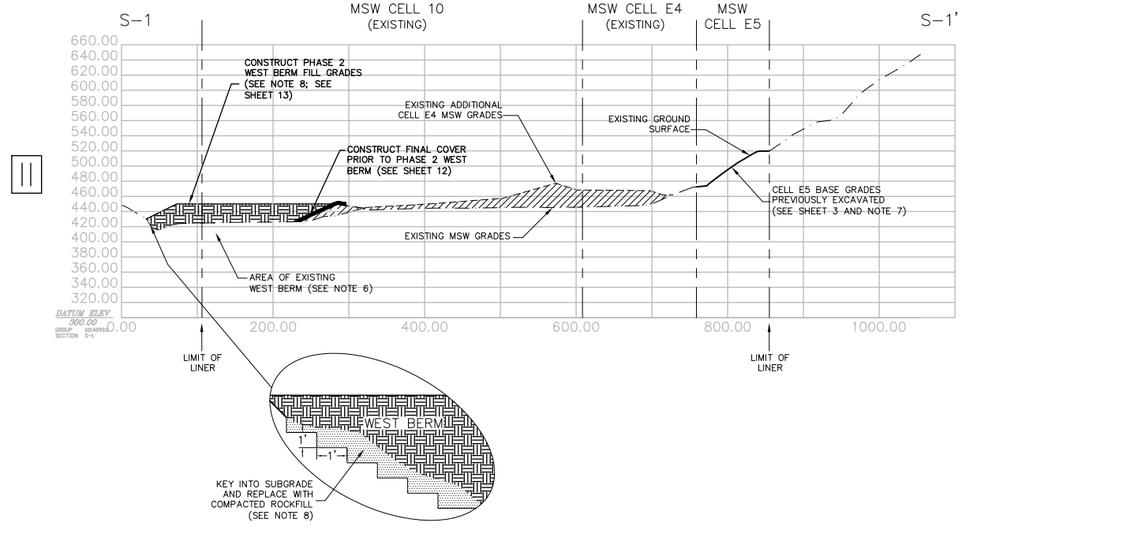
STAGE 1

(PLACE STAGE 1 MSW TO ELEVATION +450' MSL)



PHASE 2

(CONSTRUCT PHASE 2 WEST BERM TO ELEVATION +450' MSL; STAGE 1 MSW MUST BE BUILT PRIOR TO PHASE 2 WEST BERM CONSTRUCTION – SEE NOTE 6)



NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER.
2. THE LOCATION OF TIE–IN TO EXISTING LINER SHOWN IS APPROXIMATE. ACTUAL LOCATION OF TIE–IN SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND MAY VARY FROM LAYOUT SHOWN. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION, AND EXTEND AND CONNECT NEW LINER SYSTEM COMPONENTS TO EXISTING AS NECESSARY TO MAINTAIN LINER SYSTEM CONTINUITY.
3. GRADES ALONG TIE–IN MAY BE ADJUSTED AS NEEDED TO MATCH EXISTING SUBGRADE CONDITIONS WITH APPROVAL BY THE ENGINEER.
4. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.
5. BEFORE, DURING, AND AFTER STORM EVENTS, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.
6. PHASE 1 WEST BERM UP TO ELEV ~400 FT MSL CONSTRUCTED BY OTHERS AS OF 2006.
7. PORTION OF CELL E5 BASE GRADES CONSTRUCTED BY OTHERS AS OF 2006.
8. THE BERM IS TO BE KEYED INTO THE COMPETENT NATIVE SUBGRADE IN A STEP CONFIGURATION.

LEGEND

- EXISTING GROUND SURFACE (16 MARCH 2009 TOPOGRAPHY)
- WEST BERM FILL GRADES TO ELEVATION +450 FT MSL
- CELL E5 BASE GRADES (LINER GRADES)
- MSW GRADES PRIOR TO STAGE 1 MSW PLACEMENT
- MSW GRADES PRIOR TO PHASE 2 WEST BERM
- CELL BOUNDARY
- I II SEQUENCE OF CONSTRUCTION IN ORDER

HARI D. SHARMA LICENSED PROFESSIONAL ENGINEER No. 10884 HAWAII, U.S.A.

100 40 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants

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Oakland, CA 94612

CONSTRUCTION CROSS SECTION–SECTION S–1

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	
FILE:	

SHEET NO. 18

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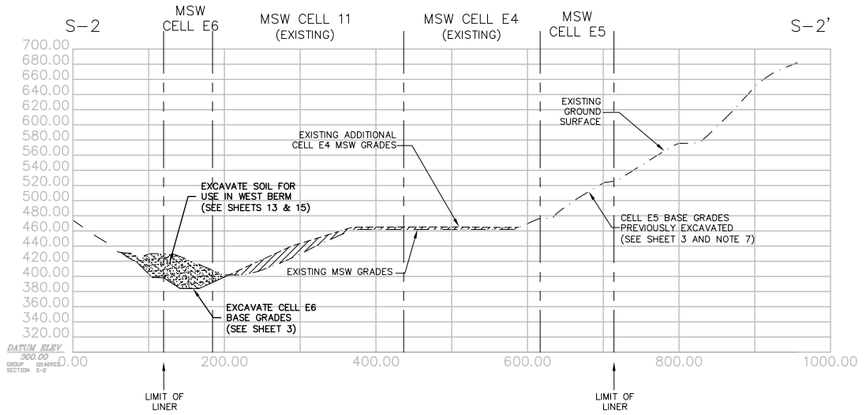
EXCAVATION

(EXCAVATE MSW CELL E6 BASE GRADES TO THE ELEVATIONS SHOWN ON SHEET 3)

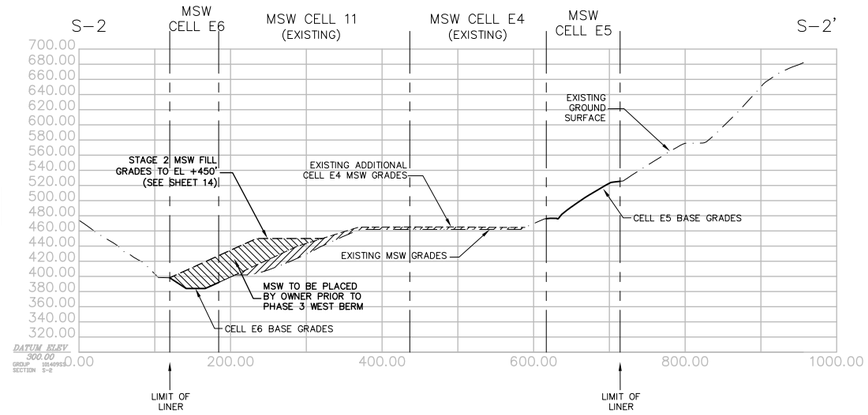
I



STAGE 2

(STAGE 2 MSW CANNOT BE PLACED UNTIL EXCAVATION FOR CELL E6 HAS BEEN COMPLETED)

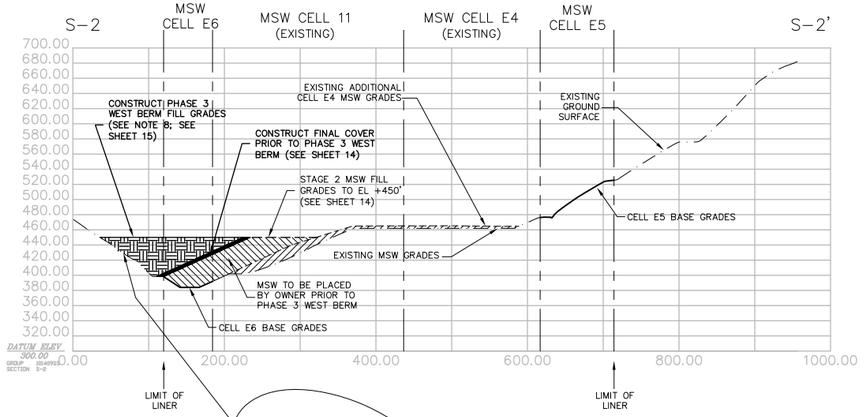
II

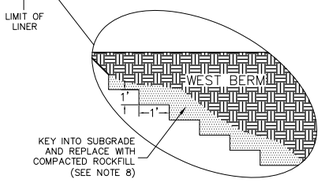


PHASE 3

(STAGE 2 MSW MUST BE BUILT PRIOR TO PHASE 3 WEST BERM CONSTRUCTION)

III

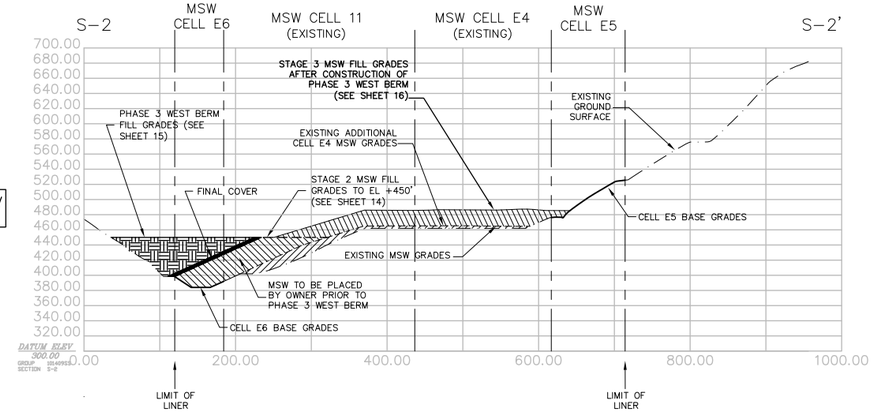




STAGE 3

(STAGE 3 MSW CANNOT BE PLACED UNTIL PHASE 3 WEST BERM HAS BEEN CONSTRUCTED TO ELEVATION GRADES SHOWN ON SHEET 15)

IV



NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER.
2. THE LOCATION OF TIE-IN TO EXISTING LINER SHOWN IS APPROXIMATE. ACTUAL LOCATION OF TIE-IN SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND MAY VARY FROM LAYOUT SHOWN. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION, AND EXTEND AND CONNECT NEW LINER SYSTEM COMPONENTS TO EXISTING AS NECESSARY TO MAINTAIN LINER SYSTEM CONTINUITY.
3. GRADES ALONG TIE-IN MAY BE ADJUSTED AS NEEDED TO MATCH EXISTING SUBGRADE CONDITIONS WITH APPROVAL BY THE ENGINEER.
4. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.
5. BEFORE, DURING, AND AFTER STORM EVENTS, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.
6. PHASE 1 WEST BERM UP TO ELEV ~400 FT MSL CONSTRUCTED BY OTHERS AS OF 2006.
7. PORTION OF CELL E5 BASE GRADES CONSTRUCTED BY OTHERS AS OF 2006.
8. THE BERM IS TO BE KEYED INTO THE COMPETENT NATIVE SUBGRADE IN A STEP CONFIGURATION.

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10884
HAWAII, U.S.A.

LEGEND

- EXISTING GROUND SURFACE (16 MARCH 2009 TOPOGRAPHY)
- WEST BERM FILL GRADES TO ELEVATION +450 FT MSL
- CELLS E5 AND E6 BASE GRADES (LINER GRADES)
- MSW GRADES PRIOR TO STAGE 2 MSW PLACEMENT
- MSW GRADES PRIOR TO PHASE 3 WEST BERM
- STAGE 3 MSW FILL GRADES
- CELL BOUNDARY
- I II III IV SEQUENCE OF CONSTRUCTION IN ORDER

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants

475 14th Street
Suite 400
Oakland, CA 94612

CONSTRUCTION CROSS SECTION-SECTION S-2

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	FILE:

SHEET NO. 19

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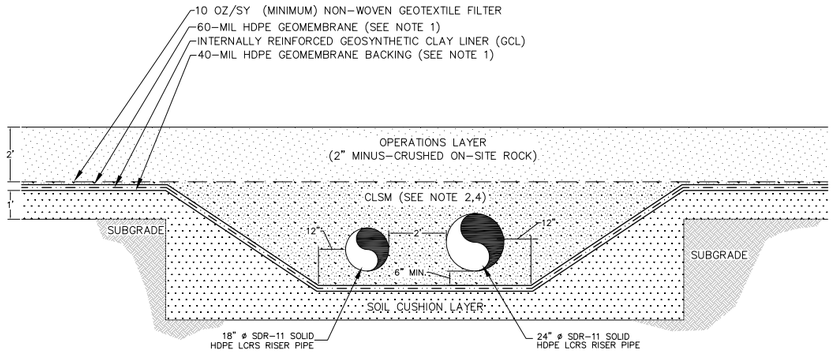
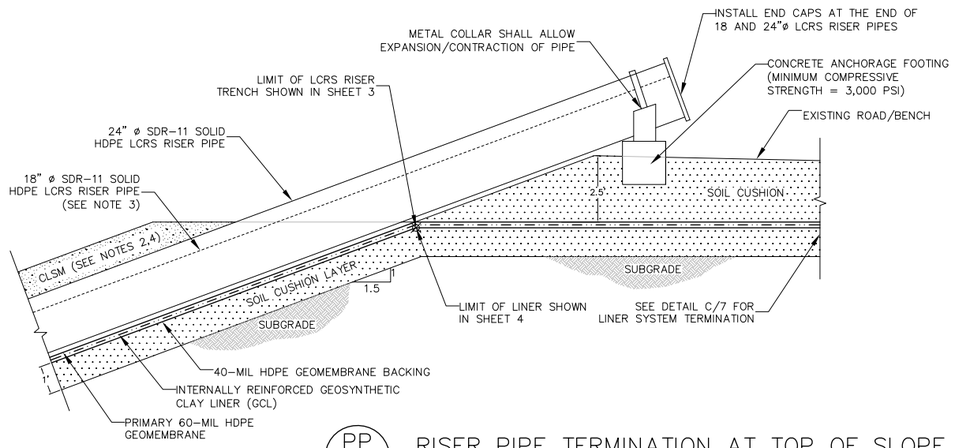


00/4 DETAIL (TYPICAL)
E8 RISER TRENCH
NOT TO SCALE



PP/3/4 RISER PIPE TERMINATION AT TOP OF SLOPE
FOR CELLS E6 & E8
NOT TO SCALE

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10894
HAWAII, U.S.A.

NOTES:

1. FOR ALL CELLS, GEOMEMBRANE SHALL BE TEXTURED ON BOTH SIDES.
2. CLSM TO BE USED FOR CELL E8 LCRS RISER PIPE TRENCH SHALL HAVE A MAXIMUM PARTICLE SIZE FOR THE AGGREGATE OF ¾"ø.
3. LCRS RISER PIPE IS ALSO GAS EXTRACTION PIPE FOR E6 RISER.
4. CLSM SHALL BE PLACED IN STAGES TO MAINTAIN RISER TRENCH STABILITY.

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REVISIONS

NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

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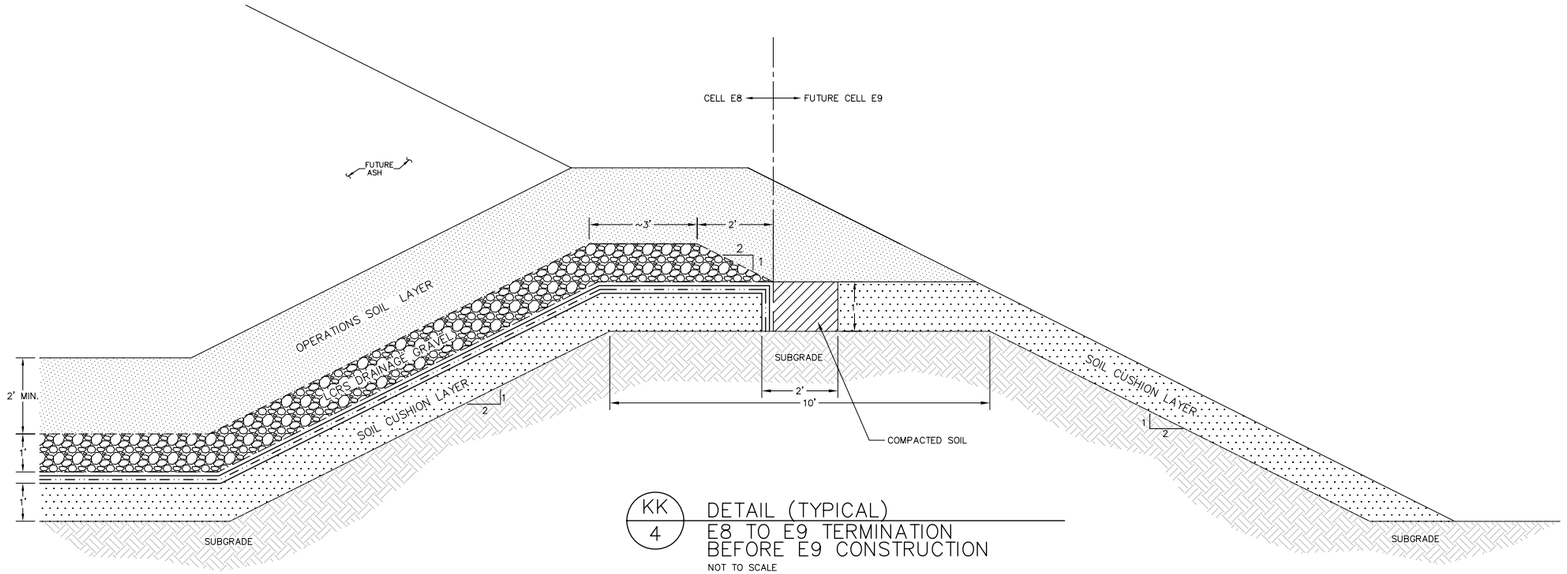
CONTAINMENT SYSTEM
DETAILS VIII

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	FILE:

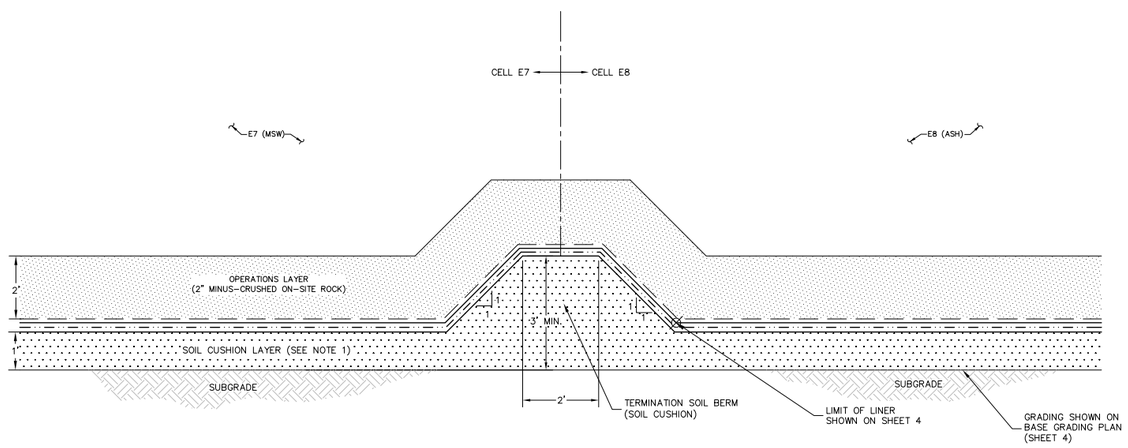
SHEET NO.
20



KK 4

DETAIL (TYPICAL)
E8 TO E9 TERMINATION BEFORE E9 CONSTRUCTION

NOT TO SCALE



LL 4

DETAIL (TYPICAL)
LINER CONNECTION CELL E7 TO E8 (NOTE 2)

NOT TO SCALE

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
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HAWAII, U.S.A.

NOTES:

1. IF SOIL CUSHION LAYER CAN NOT BE PLACED ON THE SIDE SLOPES, THEN THE SUBGRADE SHALL RECEIVE GUNITE HAVING SURFACE PROJECTIONS LESS THAN 0.25 INCH TO RECEIVE GEOSYNTHETICS.
2. ASSUMES CELLS E7 AND E8 ARE CONSTRUCTED CONCURRENTLY.

P:\CADD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E8 and Partial West Berm Construction\E5-6-DETAILS CONSTRUCTION LEVEL_REV.dwg 1-13-10 CBlong

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants

475 14th Street
Suite 400
Oakland, CA 94612

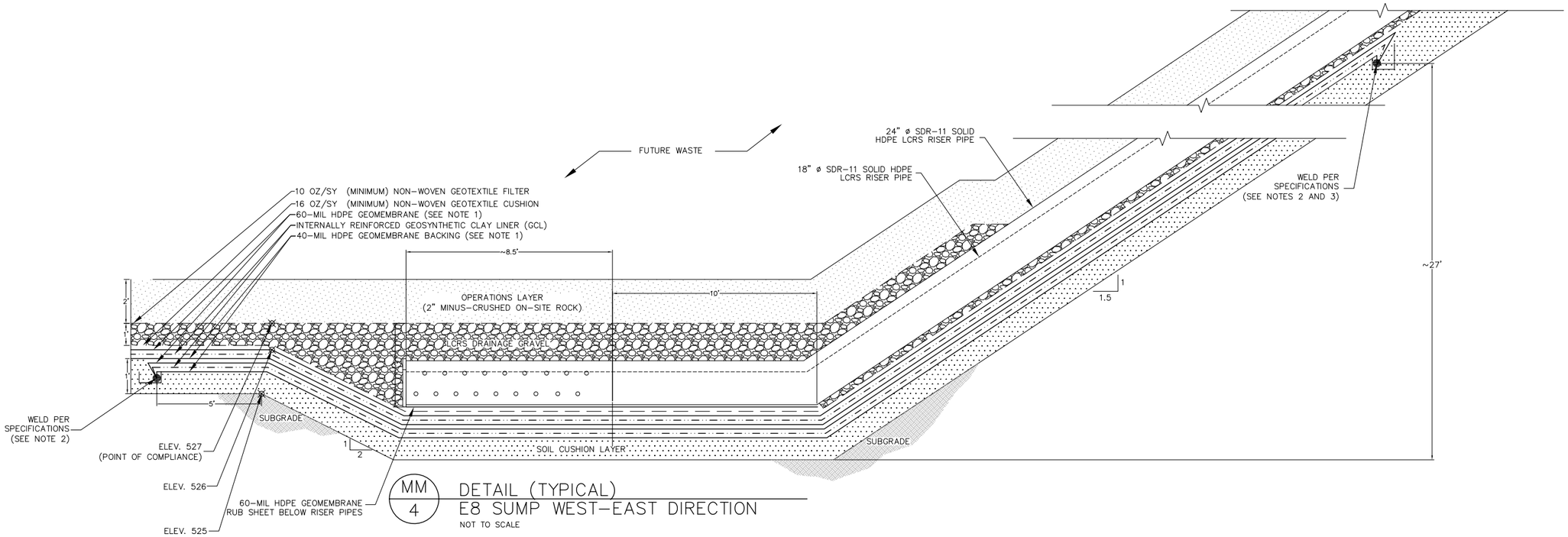
CONTAINMENT SYSTEM DETAILS IX

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

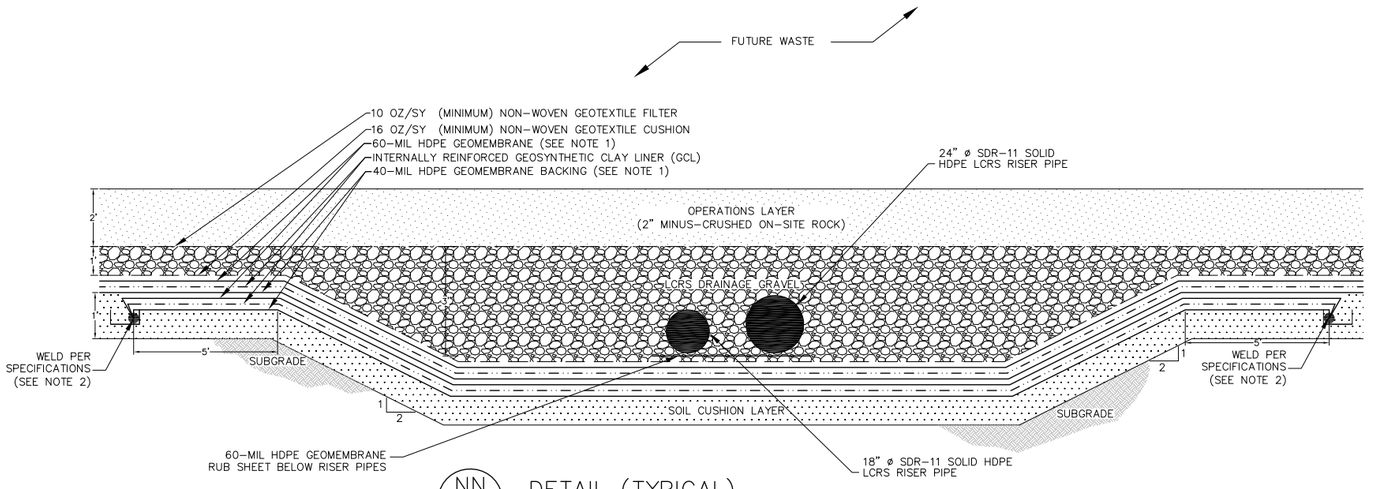
CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	
FILE:	

SHEET NO. 21



MM 4 DETAIL (TYPICAL)
E8 SUMP WEST-EAST DIRECTION
NOT TO SCALE



NN 4 DETAIL (TYPICAL)
E8 SUMP NORTH-SOUTH DIRECTION
NOT TO SCALE

HARI D. SHARMA
LICENSED PROFESSIONAL ENGINEER
No. 10994
HAWAII, U.S.A.
Hari D. Sharma

NOTES:

1. FOR ALL CELLS, GEOMEMBRANE SHALL BE TEXTURED ON BOTH SIDES.
2. INSERT SECONDARY ENCAPSULATED LINER SYSTEM INTO 6" DEEP TERMINATION TRENCH AND BACKFILL WITH COMPACTED SOIL CUSHION.
3. EXTEND DOUBLE-LINER SYSTEM FROM SUMP TO BENCH AT ELEVATION 549 FT APPROXIMATELY.
4. PIPE MATERIAL SHALL BE HDPE OR FRP.

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants

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Oakland, CA 94612

CONTAINMENT SYSTEM DETAILS X

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	
FILE:	

SHEET NO. 22

NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER. WASTE ELEVATIONS MAY VARY.

2. THE LOCATION OF TIE–IN TO EXISTING LINER SHOWN IS APPROXIMATE. ACTUAL LOCATION OF TIE–IN SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND MAY VARY FROM LAYOUT SHOWN. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION, AND EXTEND AND CONNECT NEW LINER SYSTEM COMPONENTS TO EXISTING AS NECESSARY TO MAINTAIN LINER SYSTEM CONTINUITY.

3. GRADES ALONG TIE–IN MAY BE ADJUSTED AS NEEDED TO MATCH EXISTING SUBGRADE CONDITIONS WITH APPROVAL BY THE ENGINEER.

4. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.

5. BEFORE, DURING, AND AFTER STORM EVENTS, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.

6. EXISTING CONCRETE CHANNEL (INCLUDING WINGWALLS AND HEADWALL) AND EXISTING 48" ø PIPES TO BE REMOVED WITHIN THIS AREA, PRIOR TO SUBGRADE PREPARATION OF CELL E6.

7. BENCHES THAT WILL NOT RECEIVE LINER SHALL BE LOCALLY GRADED SO THAT WATER FLOWS AWAY FROM LANDFILL.

8. IF COLLUVIUM OR ALLUVIUM ARE ENCOUNTERED DURING EXCAVATION, SLOPES SHALL BE RE–EVALUATED AND MAY NEED TO BE FLATTENED.

9. A SUBDRAIN PIPE MAY BE REQUIRED TO COLLECT SEEPS. SEEPS TO BE IDENTIFIED BY A GEOLOGIST. SUBDRAIN PIPE MAY NEED TO BE EXTENDED PAST THE LIMITS CURRENTLY SHOWN.

10. SLOPES SHALL BE EXCAVATED FROM TOP DOWN. CONTRACTOR SHALL ALLOW A GEOLOGIST TO ACCESS THE EXCAVATED SLOPES FOR GEOLOGIC MAPPING AND TO CONFIRM THAT THE SLOPES WILL BE STABLE.

NOTES (CONT.):

11. RISER PIPES SHALL BE EXTENDED AS WEST BERM IS CONSTRUCTED.

12. AREA OF INCREASED GRAVEL THICKNESS SHOWN ON SHEET 4.

13. EXCAVATION FOR SUMP AREA AND ITS VICINITY WILL REQUIRE SPECIAL PROVISIONS; THEREFORE COORDINATION WITH OWNER/OPERATOR WILL BE REQUIRED.

14. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE–GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.

LOCATION OF EXISTING UTILITIES SHALL BE CLEARLY MARKED BY FLAGGED 4–FT HIGH WOODEN STAKES AT 100–FT INTERVALS AND PAINT ON THE GROUND SURFACE. NEARER INTERVALS MAY BE REQUIRED BASED ON FIELD CONDITIONS. CONTRACTOR SHALL MONITOR AND MAINTAIN THE MARKINGS DURING THE CONSTRUCTION PROJECT UNTIL FINAL ACCEPTANCE OF THE WORK BY THE OWNER/OPERATOR.

15. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CITY, STATE AND FEDERAL HEALTH AND SAFETY REQUIREMENTS TO GUARD AND PROTECT ALL WORKERS, PEDESTRIANS, AND THE PUBLIC FROM EXCAVATIONS, BLASTING OPERATIONS, CONSTRUCTION EQUIPMENT, TRAFFIC, CONSTRUCTION OPERATIONS, ALL OBSTRUCTIONS, AND OTHER DANGEROUS ITEMS (E.G., LANDFILL GAS) OR AREAS. A HEALTH AND SAFETY PLAN IS REQUIRED AS PART OF THE WORK.

16. EXPECTED TO BE CONSTRUCTED BETWEEN 2010 AND 2014.

17. LIMIT OF FUTURE WASTE FILL IN CELLS E5 THROUGH E8 MAY CHANGE DEPENDING ON FUTURE WASTE STREAM.

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LEGEND

- 480 — CELLS E5 THROUGH E8 BASE GRADE 10–FT CONTOUR (MSL)
- 800 — EXISTING GROUND 10–FT CONTOUR (MSL)
- 4 / 288.16 — EXISTING BENCHMARK
- CELL BOUNDARY/LIMIT OF FUTURE WASTE FILL (NOTE 17)
- PROPERTY LINE
- APPROXIMATE LIMIT OF EARTHWORK
- APPROXIMATE CELLS E5 THROUGH E8 LINER LIMIT (NOTE 16)

100 50 0 100 200
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

Geosyntec consultants
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CELL BOUNDARIES AND PROPOSED LINER LIMIT

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: JANUARY 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	FILE:

SHEET NO.
23

QQ 4 PLAN
CELL E8 LCRS SUMP

LEGEND

- 530 — CELL E8 BASE GRADE 10-FT CONTOUR (MSL)
- 526 — CELL E8 BASE GRADE 2-FT CONTOUR (MSL)
- CELL E8 BASE GRADE GRADEBREAK
- EXISTING GROUND 10-FT CONTOUR (MSL)
- CELL BOUNDARY

NOTES:

1. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.

2. BEFORE, DURING, AND AFTER STORM EVENTS, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.

3. GRADES SHOWN ARE FOR TOP OF SUBGRADE.

4. PIPE MATERIAL SHALL BE HDPE OR FRP.

SCHEDULE OF CONTROL POINTS

POINT	NORTHING	EASTING	ELEVATION (FT)
9000	71621.59	459181.33	524.96
9001	71615.84	459212.04	525.19
9002	71648.59	459217.67	525.19
9003	71653.44	459186.81	524.96
9004	71626.88	459186.93	521.88
9005	71623.49	459206.64	521.88
9006	71643.20	459210.03	521.88
9007	71646.59	459190.32	521.88
9008	71632.33	459214.23	524.87

HARI D. SHARMA LICENSED PROFESSIONAL ENGINEER No. 10884 HAWAII, U.S.A.

10 5 0 10 20
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

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CELL E8 SUMP

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: FWS	DATE: FEBRUARY 2010
DRN BY: LKH	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	
FILE:	

SHEET NO. 24

P:\CADD\Land Projects 3\WA\Waimanalo\dwg\Cells E5-E8 and Partial West Berm Construction\E5-8-GRADING CONSTRUCTION LEVEL4.dwg 2-11-10 CWong

FOR INFORMATION ON SURFACE WATER PIPES REFER TO GEI CONSTRUCTION DRAWINGS

SEE NOTE 8

EXTEND THE EXISTING SUBDRAIN PIPE ABOVE FINAL COVER LINER TO NEW EDGE OF FINAL COVER

EXISTING SUBDRAIN PIPE

CHANGE TO SOLID PIPE APPROXIMATELY 5 FEET PRIOR TO EDGE OF FINAL COVER SYSTEM (SEE RR/26)

WEST BERM BUTTRESS (SEE NOTE 9)

EXTEND TO EXISTING SURFACE WATER SYSTEM ALONG ACCESS ROAD

EXISTING WEST BERM

MSW CELL 6

MSW CELL 7

MSW CELL 8

MSW CELL 2

MSW CELL

RR 26

EE 17

CC 17

FF 17

GG 17

LEGEND

- 440 — WEST BERM BUTTRESS 10-FT CONTOUR (MSL)
- AREA TO BE CLOSED PRIOR TO WEST BERM BUTTRESS PLACEMENT
- 800 — EXISTING GROUND 10-FT CONTOUR (MSL)
- CELL BOUNDARY
- NEW SURFACE WATER PIPES (SEE GEI CONSTRUCTION DRAWINGS)
- PROPERTY LINE
- APPROXIMATE LIMIT OF EARTHWORK
- EXISTING SUBDRAIN PIPE
- SURFACE WATER FLOW DIRECTION
- APPROXIMATE LOCATION OF SUBDRAIN PIPE EXTENSION (PERFORATED AND SOLID)
- 12 — CONTROL POINTS (SEE TABLE BELOW)

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Point No.	Northing	Easting	Elevation (ft)	Notes
1	69,330.58	457,905.12	350	Top of Buttress
2	69,444.70	457,713.18	350	Top of Buttress
3	69,432.24	457,653.58	330	Top of Buttress
4	69,335.30	457,680.50	350	Top of Buttress
5	69,375.55	457,635.19	330	Top of Buttress
6	69,239.40	457,585.63	350	Top of Buttress
7	69,210.59	457,509.78	330	Top of Buttress
8	69,199.83	457,464.66	300	Top of Buttress
9	69,134.20	457,461.41	300	Top of Buttress
10	69,067.72	457,592.52	300	Top of Buttress
11	69,090.91	457,745.78	330	Top of Buttress
12	69,126.63	457,808.01	350	Top of Buttress

NOTES:

1. EXISTING TOPOGRAPHY BASED ON 16 MARCH 2009 AERIAL SURVEY PROVIDED BY OWNER.

2. THE LOCATION OF TIE-IN TO EXISTING LINER SHOWN IS APPROXIMATE. ACTUAL LOCATION OF TIE-IN SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION AND MAY VARY FROM LAYOUT SHOWN. CONTRACTOR TO FIELD LOCATE AND UNCOVER EXISTING LINER SYSTEM TERMINATION, AND EXTEND AND CONNECT NEW LINER SYSTEM COMPONENTS TO EXISTING AS NECESSARY TO MAINTAIN LINER SYSTEM CONTINUITY.

3. GRADES ALONG TIE-IN MAY BE ADJUSTED AS NEEDED TO MATCH EXISTING SUBGRADE CONDITIONS WITH APPROVAL BY THE ENGINEER.

4. FOR VEHICULAR TRAFFIC ON LINER SYSTEM, MINIMUM ALLOWABLE GROUND PRESSURES AND COVER MATERIAL REQUIREMENTS IN THE SPECIFICATIONS TO BE FOLLOWED AT ALL TIMES DURING AND AFTER CONSTRUCTION.

5. BEFORE, DURING, AND AFTER STORM EVENTS DURING CONSTRUCTION, CONTRACTOR TO CONTROL AND DIRECT SURFACE WATER RUNOFF BY PUMPING OR OTHER METHODS. CONTRACTOR TO COORDINATE WITH OWNER FOR EROSION CONTROL METHODS.

6. A MINIMUM OF THREE DAYS BEFORE STARTING CONSTRUCTION AND AS PART OF MOBILIZATION, CONTRACTOR WITH OWNER/OPERATOR SHALL CLEARLY MARK/IDENTIFY THE LOCATION OF EXITING UTILITIES AND/OR FACILITIES. EXISTING UTILITIES MAY BE OVERHEAD, ABOVE-GROUND, OR BURIED. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO, OVERHEAD POWER LINES AND EXISTING FOUNDATIONS; GROUNDWATER MONITORING WELLS; LANDFILL GAS PROBES; LANDFILL GAS WELLS; SURFACE WATER SAMPLING LOCATIONS; LANDFILL GAS, LANDFILL CONDENSATE, AND LEACHATE PIPELINES; SURFACE CONTROL PIPES; ETC. COORDINATION WITH LOCAL UTILITIES AND/OR A PRIVATE UTLITY LOCATION SERVICE MAY BE REQUIRED.
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7. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CITY, STATE AND FEDERAL HEALTH AND SAFETY REQUIREMENTS TO GUARD AND PROTECT ALL WORKERS, PEDESTRIANS, AND THE PUBLIC FROM EXCAVATIONS, BLASTING OPERATIONS, CONSTRUCTION EQUIPMENT, TRAFFIC, CONSTRUCTION OPERATIONS, ALL OBSTRUCTIONS, AND OTHER DANGEROUS ITEMS (E.G., LANDFILL GAS) OR AREAS. A HEALTH AND SAFETY PLAN IS REQUIRED AS PART OF THE WORK.

8. CONTRACTOR SHALL BE AWARE OF EXISTING GUY WIRES FOR HECO POWERLINES.

9. WEST BERM BUTTRESS SHALL BE CONSTRUCTED IN GENERAL ACCORDANCE WITH SECTION 02211 OF THE SPECIFICATIONS.

50 25 0 50 100
SCALE IN FEET

REVISIONS			
NO.	DESCRIPTION	DATE	BY

WASTE MANAGEMENT

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WEST BERM BUTTRESS

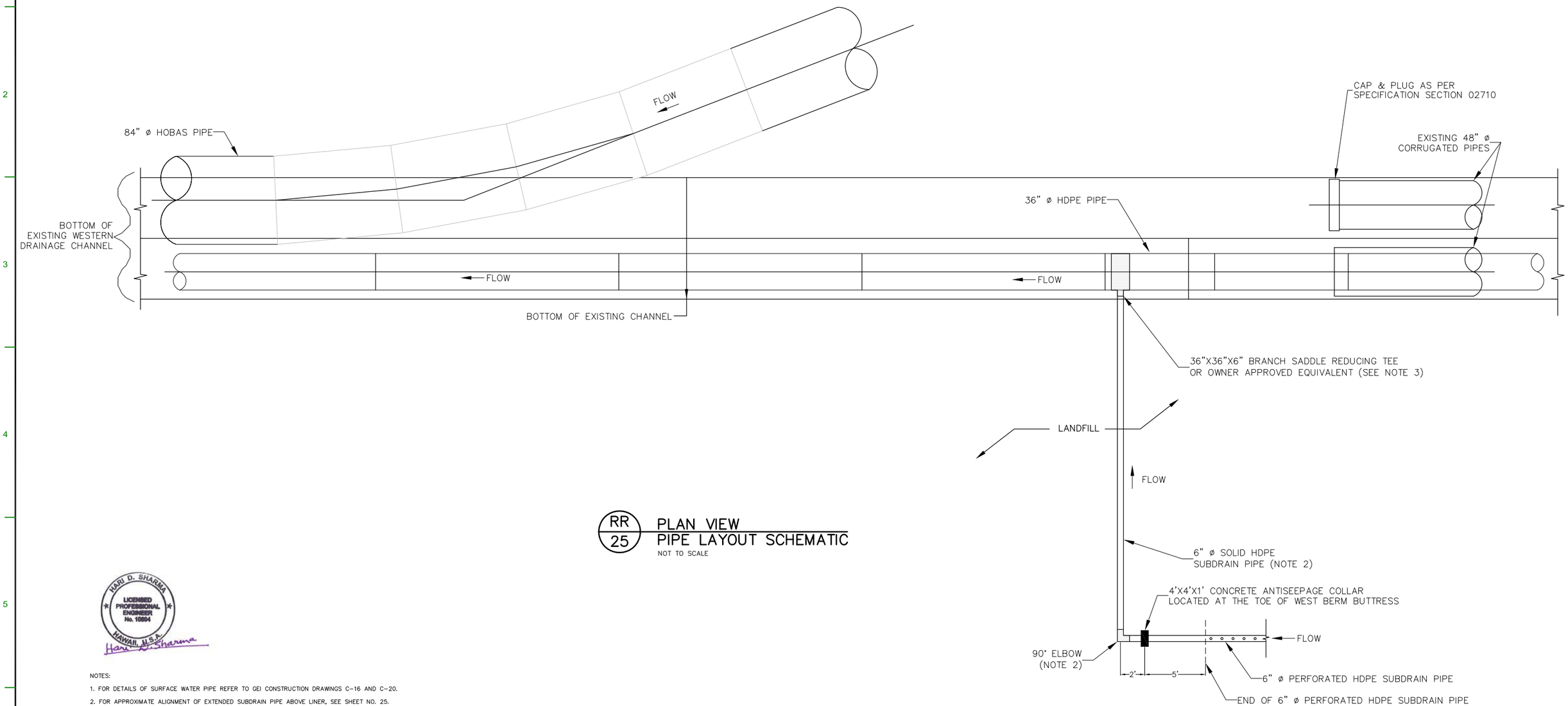
WEST BERM BUTTRESS
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS

DES BY: ACP	DATE: MARCH 2010
DRN BY: ACP	SCALE: AS SHOWN
CHK BY: FWS	PROJECT: WL0770
REV BY: HDS	DOCUMENT:
APP BY: HDS	FILE:

SHEET NO.
25

P:\CADD\Land Projects 3\WM\Waimanalo\dwg\Cells E5-E6 and Partial West Berm Construction\West Berm Buttress-Grading.dwg 3-11-10 02:05:16 PM APadovani



RR 25 PLAN VIEW
PIPE LAYOUT SCHEMATIC
NOT TO SCALE

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NOTES:

1. FOR DETAILS OF SURFACE WATER PIPE REFER TO GEI CONSTRUCTION DRAWINGS C-16 AND C-20.
2. FOR APPROXIMATE ALIGNMENT OF EXTENDED SUBDRAIN PIPE ABOVE LINER, SEE SHEET NO. 25.
3. CONNECTION OF REDUCING TEE TO 36" ø SURFACE WATER PIPE MAY NEED TO BE ROTATED TO ADDRESS FIELD CONDITIONS ENCOUNTERED.

REVISIONS			
NO.	DESCRIPTION	DATE	BY
	ADDED DRAWING	11 MAR 10	

WASTE MANAGEMENT

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SCHEMATIC PLAN VIEW OF SURFACE WATER PIPES

CELLS E5 THROUGH E8
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

CONSTRUCTION DRAWINGS		
DES BY: FWS	DATE: MARCH 2010	SHEET NO. 26
DRN BY: CAW	SCALE: AS SHOWN	
CHK BY: FWS	PROJECT: WL0770	
REV BY: HDS	DOCUMENT:	
APP BY: HDS		
FILE:		

P:\CAD\Land Projects 31\WM\Waimanalo\dwg\Cells E5-E6 and Partial West Berm Construction\E5-6-DETAILS CONSTRUCTION LEVEL_REV.dwg 3-11-10 CWong